Author:
Cerna, Miguel

Title:
Technology-enhanced Professional Development of School Teachers in Chile

An Action Research Exploration

Technology-enhanced Professional Development of School Teachers in Chile: An Action Research Exploration

By: Miguel Cerna

A dissertation submitted to the University of Bristol in accordance with the requirements of the degree of Doctor of Philosophy in the Faculty of Social Sciences and Law.

OCTOBER 22, 2018

School of Education,
University of Bristol

Word Count: 82.086

Abstract

Technology use for teachers' professional development has attracted research interest over many years. The collaborative potential of technology for facilitating problem-solving and distance research has been shown to benefit teachers' learning. In Chile, technology for collaboration and the emerging interest in research-based approaches have also been regarded as core areas of professionalization by the Ministry of Education (MINEDUC). This study explores the mediating potential of technologies for the professional development of teachers in Chile with a focus on collaborative activity in a wiki through action research-based professional development opportunities. This study also supports the exploration of my own practices as a teacher educator and serves my intention to reflect upon the nature of (online) professional development and (online) collaboration through action research.

This action research study involved eleven teachers working voluntarily in a professional development offering termed the Wiki project. This project aimed at connecting teachers from different Chilean regions for collaboration, reflective practice, and involvement in aspects of research with the support of technology. Online and face-to-face semi-structured interviews, email communication, and collaborative work in Google Docs, as wiki, were used to gather data on the participants' social practices of professional development and collaboration. Thematic analysis and interaction analysis were employed, with the study being based on a socio-cultural view of learning in order to understand the role of mediation, reflection, and collaboration in teachers' learning.

The study found that technology use granted possibilities, while also introducing challenges, for distance collaboration and reflection. For example, the school context, teachers' attitudinal dispositions toward collaboration and technology use, and the social practices the wiki promoted, along with facets of our relationships, were the supporting and limiting factors in online developmental processes. First and foremost, collegial support from teachers' own schools in their projects, complemented with the exchange of advice, material, and experiences, were the main collaborative approaches present in the wiki. These findings suggest that it is necessary to educate teachers about online collaboration and also highlight the importance of school support in school research processes.

Author’s declaration

I declare that the work in this dissertation was carried out in accordance with the requirements of the University's Regulations and Code of Practice for Research Degree Programmes and that it has not been submitted for any other academic award. Except where indicated by specific reference in the text, the work is the candidate's own work. Work done in collaboration with, or with the assistance of, others, is indicated as such. Any views expressed in the dissertation are those of the author.

SIGNED: ..... DATE: .....

Acknowledgments

I would like to thank those who guided and supported my professional and personal development throughout this journey. First, to my family, my mother Adriana, my sister Rita, and my father Hernan. Your encouragement has made a difference in my life, and it would have been impossible to achieve this moment without your understanding and support.

Thanks to my supervisors Professor Sally Barnes and Dr. Sue Timmis from the University of Bristol. Your guiding hands have illuminated my research journey and your wise words were always an ally in difficult times. Thanks for your patience and consideration while making sense of my understanding. I would also like to extend my gratitude to the Chilean Government for funding my studies in Bristol University through the Becas Chile scholarship programme, and to the participants in my study to whom I feel deeply indebted. Their generosity, willingness to participate, honesty, and enthusiasm made this thesis possible.

Thanks to my colleagues and friends at the University of Bristol, especially Paulina, Carolina, Paola, Alfredo, Jane, Sana, and Mauricio, for their encouragement, wise advice, and excellent feedback. All of you are part of this thesis. A special mention goes to all the wonderful friends I have met during these years, in special to Nick Worthy who was always there during troubled times. Thanks for everything.

My final remark is reserved to my grandmother Maria. I know she is so proud of me, as I am grateful for all the love and dedication, she put in every single action towards me. I will always love you!

Thanks to all

Contents

List of Appendices

Abbreviations

Chilean Ministry of Education	**MINEDUC**
Computer-mediated communication	**CMC**
Computer-supported collaborative learning	**CSCL**
English Open Doors Programme MINEDUC	**PIAP**
English language teaching	**ELT**
Information and Communications Technology	**ICT**
Massive Open Online Course	**MOOC**
Modular Object-oriented Dynamic Learning Environment	**MOODLE**
Sistema de Medición de la Calidad de la Educación (Quality of Education Assessment System)	**SIMCE**
Zone of proximal development	**ZPD**

List of Tables

List of Figures

Chapter 1: Introduction

Teachers' professional development is one of the main pillars of social development in current times. Teachers are the ones influencing ideas, promoting understanding, guiding developmental processes in young people, and, more importantly, embracing the value of education in others through their actions and attitudes while teaching, hence becoming active contributors to social change in societies (McNiff and Whitehead, 2013). Awareness of these ideas, along with the political, economic, and technological demands for improving education in the last decades, have prompted governments around the world to change their approaches to teacher education by acknowledging teachers' own potential as autonomous learners with the capacity to create their developmental path. Collaborative work and research-based approaches to teachers' professionalization are the main premises for igniting behavioural, attitudinal, and cognitive development in teachers (Borg, 2014; Burns, 2015). First and foremost, teachers make these ideas their own, incorporating their professional development into the systematic examination of their contextual problems, thus satisfying their needs and professional interests with those who understand them best, i.e. other teachers.

The use of technology has impacted teachers' professional development at various levels over the years. For example, it has enabled interactive teaching approaches that place learners in active, connected, collaborative, and in-movement positions (Erstad, 2014). More importantly, technology has impacted teachers' relationship with their own learning after understanding that technology not only bridges geographical distances for information sharing and transmission or social communication, but also grants possibilities for effective communication, collaboration, social impact, knowledge creation, and the application of technological knowledge for learning with and from others (MINEDUC, 2011). This study explores how technologies mediate the professional development of a group of Chilean teachers who ventured to tackle their own development by collaborating with other teachers online to improve contextual problems affecting their practices using a problem-solving action research approach. Lastly, this study also provides an opportunity to explore my own practices as a teacher educator through a constructive methodology that serves my intention to explore and reflect upon the nature of (online)

professional development and (online) collaboration, with the means of construction being action research as well.

1.2 Research rationale

There are numerous international studies exploring online collaboration through discussion-based technologies including wikis, blogs, forums, and discussion boards for teachers' professional development, at both the in-service and pre-service levels (Chan, 2011; Ng, 2014; Biasutti & El-Deghaidy, 2015; Brox, 2017). These include research addressing collaborative activity for understanding teachers' reflective processes in blogs (Hall, 2018) or more ecological studies exploring motivation and attitudes affecting collaborative activity in wikis and forums (Cakir, 2013; Brass & Mecoli, 2011). Specifically, regarding my study, research involving collaborative practice for improving aspects of teaching through the sharing and creation of ideas in wikis (Lai and Ng, 2011) has also been explored. Overall, these studies examine teachers' approaches to online collaboration practically through engagement in discussions, co-creation of products and ideas, or problem-solving for improving teachers' learning and teaching. This research has mainly impacted professional development offerings over the years, and it is not surprising that in-service and pre-service programmes around the world include discussion-based technologies for embracing meaning-making processes during and after teaching activity in practical ways. As such, the practice of online collaboration has become one interest hub to explore, understand, and expand knowledge on how interactions become meaningful collaborative practices for the construction and support of teachers' developmental processes. This study builds on previous literature and existing knowledge by engaging primary and secondary school teachers in online discussions for problem solving, sharing of material, and professional debate. The study aims to provide a deeper understanding of what is involved in online collaboration for professional development.

In Chile, MINEDUC (Chilean ministry of education) professional development offerings have expanded beyond face-to-face programmes (e.g. Online Moodle/MOOC CPEIP courses) and currently include research-based components for more autonomous and contextual teacher development (e.g. MINEDUC Champion Teachers Programme or ELT methodology courses). Chilean researchers have explored these areas; for example, Morales (2015) explored English

teachers' development of computer assisted language learning skills (CALL) in online teacher education with a focus on teachers' reflective practice, while Rebolledo (2013) examined action research components and teachers' usage in ELT methodology courses. Hence, these two authors have contributed to local knowledge about (online) professional development of a collaborative, reflective, and research-based nature. My study adds to that contribution and explicitly addresses the ongoing nature of professional development by considering the notion of trajectory (Dreier, 1999; Rasmussen, 2005) as analytical unit. The exploration of trajectories provides insights into the social practice of professional development from various perspectives, including, for example, the socio-cultural aspects fostering or limiting participation in teachers' developmental experience, the various manifestations of professional development linked to certain social practices, the understanding of offline participatory practices during teachers' developmental processes, and the intrinsic and sometimes undetected ethical aspects emerging in the social practice of professional development and teaching. All this suggests an integrative, comprehensive, and contextual approach to the exploration of professional development in a Chilean context.

Finally, my work experience as an online teacher educator in 2014 and 2015 with Chilean English teachers in the British Council Certificate in Secondary English Language Teaching (CiSELT, 2013) also promoted my motivation to explore this research topic. In this regard, the challenges I faced when motivating teachers to participate, interact, and engage in the practice of collaboration in online discussions encouraged me to explore what it takes to collaborate online, the impact of (online) collaboration in the professional development of teachers in Chile, and the aspects hindering or promoting collaboration. I have always regarded collaboration as an important part of the core triad of professional development, along with reflection and inquiry (Evans, 2014; Prestridge, 2017). This PhD research gave me the opportunity to explore collaboration from a practical and a research perspective, involving me and a group of teachers to collaborate on our professional development.

1.3 Why Action research?

I took into account the economic and access challenges I faced during my journey towards professional development in Chile. However, I also considered how, as part of collaborative work

with colleagues at school and participation in various MINEDUC offerings (e.g. Pasantias, 2006; ELT methodology courses, summer/winter camps, Champion Teachers, 2013), dialogue and autonomy –through collaborative and research-based approaches– were always encouraged as elements for my development and helped me become the professional I am now. As such, it is relevant for me to learn and develop professionally through a practical methodology that considers knowledge construction based on my professional experiences, constructive actions, and reflections (McNiff & Whitehead, 2013; Burns, 2015), while significantly supporting and understanding the professional development process of teachers in Chile. First of all, I should note that my participation in MINEDUC Champion Teachers in 2013 (Rebolledo, Smith and Bullock, 2016) made it clearer to me that teachers in Chile need professional development initiatives that include an exploratory, contextual, and comprehensive approach toward working in research, pertinently integrating the theory-practice divide. This also grants opportunities to work with peers online and offers possibilities to adapt research procedures to teachers' individual contextual needs by incorporating time constraints and resource considerations. But more importantly, it provided an approach that promotes an exploratory action research model to support one's understanding of parts of one's own practice. As such, MINEDUC Champion Teachers has inspired aspects of this study.

So far, I have presented the rationale of this study by claiming that my professional trajectory as learner, teacher, and teacher educator permeated my intention to explore (online) professional development and collaboration by following an action research approach. While doing this, I suggested that MINEDUC professional development offerings over the years have enriched my professional profile. Hence, it is relevant for a study exploring teachers' professional development to define some pertinent historical issues affecting the profile of Chilean teachers over the years. A historical account can shed light on how teachers' profile has been shaped through governmental policies in three identifiable periods: before the military government, during the military government, and today. This account also grounds the research context presented, providing the basis for the problematization of professional development in Chile and justifying my professional intentions in this project.

1.4 Research background: Professional development in Chile and the teachers' profile

Chilean teachers' profiles are closely linked to government involvement in education and the political history of the country. Since the foundation of the republic in the 19th century, the Chilean government adopted a role as educator by organizing, developing, and controlling the educational system in aspects like teachers' professional development, educational plans, and students' wellbeing (Núñez, 1990). Unfortunately, this role was overshadowed by a 16-year military government in the 70s and 80s that disarticulated the state as educator system and promoted market-oriented regulations that affected teachers' working conditions, educational plans, and the whole organization of the school system by privatizing schools (Ávalos, 2002). In the 90s, democracy returned to Chile, and presidents' intentions refocused on providing equal educational opportunities in the public sector, and for the first time in many years the concept of "supporting teachers' professional development" (Cox, 2005) started to echo loudly. From the 90s onwards, the Chilean government has focused on changing the nature of educational policies by promoting social equality through free education and by increasing the availability of professional development programmes, thus affecting teachers' profile as professionals in the 21st century.

World and national history have also influenced Chilean teachers' profiles. The formation of the teachers' labour union during the 20th century and "the colegio de profesores" in the military government (Nuñez, 2002) created a strong desire for social justice, respect, and equality among teachers. This promoted teachers' neglect to adapt to current professional development policies involving ongoing assessment processes through portfolios and standardized tests. Today, Chilean teachers claim that the government should take an active role in education by guaranteeing better working conditions, salaries, and free education for the citizens and that professionalization should consider their years as teachers, their working conditions, performance rewards, and the complexities of working in a market-oriented education system that has profited from education over the last 30 years.

1.4.1 Before the military government: The state as educator

In the 19th century, the government was in charge of administering the educational system, which involved school resources, infrastructure, teachers' education, and curriculum design. During this period, the state acted as a *benefactor*: public investment was not only focused on industry or agriculture, but also sought to improve the living conditions of the people (Núñez, 1995). In fact, all educational laws since 1813 until the start of the military government in 1973 were created, promoted, and applied by the governments of those times. For example, during the second half of the 19th century, the government created the first school of *normal teachers*, a term coined in the US to refer to teachers who adopt values and ethical procedures to teach rather than just impart knowledge. This gave rise to the first "professionalization of teachers" *(profesionalización de profesores)* (Nuñez, 2002: 458), led by a group of visitors and other normal teachers who supervised and trained the twenty-eight male candidates under standards of Christianity, good manners, and honour.

Figure 1.1The state as educator, School of normal teachers 1992

Subsequently, between 1860 and 1900, the government instigated twelve legal regulations to improve *the state as educator* system (Campos, 2000). Of these regulations, the clearest examples of government involvement in professional development were *the organic law of primary instruction* (1860), which set retirement regulations for teachers; Miguel Luis Amunátegui's 1874 speech about *women's education,* which raised awareness about the importance of women as

teachers and the necessity to change the futile curricula for women; and finally, the most explicit law addressing teachers' responsibilities, administrative tasks, roles as head and subject teachers, and an incipient proposal of collaborative work –though teachers' school meetings– was the *regulation of normal schools* in 1899. This law captured a first description of teachers as professionals by including roles, responsibilities, image in society, duties, and attributes both for normal (public) schools and the already created dissident schools, or for private institutions which were not aligned with the Catholic dogma of normal schools (Campos, 2000).

During the 20th century and until 1970, the government continued legislating with an emphasis on improving the regulations and infrastructure of normal schools as well as teacher education in normal institutions. Normal institutions, like the *Instituto Pedagógico de la Universidad the Chile*, were free and included a six-year programme of general and pedagogical education in disciplines such as numeracy and literacy (Nuñez, 2002). At that time, this government initiative had a positive impact, and teachers were recognized as critical pillars of the new society. Teachers had an enormous social and political involvement that emancipated multiple levels of society, ranging from politics to industry (Campos, 2000; Núñez, 1990, 1995). The government wanted and needed qualified citizens, so over the years it created different laws to support the development, training, and inclusion of teachers in society, as teachers were considered government employees. However, the economic crisis of 1929 generated the first tensions between teachers and the government. The government was unable to cope with the increasing material and economic demands of education –school infrastructure, teacher preparation, salaries, and materials– and dramatically reduced the budget allocated for teachers' salaries and development (Avalos, 2002; Nuñez, 2002). As a consequence of these tensions, teachers organized the first labour union during the twenties, and marches and strikes increased gradually over the next decades. In 1940, the teachers' labour union was at its peak, and teachers were actively participating in debates to re-empower the role of the government in the improvement of the education system. Several authors (Campos, 2000; Cox, 2005) comment on how the labour union spirit impregnated the culture and identity of today's teachers by giving them a stronger political and social role in society. More importantly, the military coup d'état in 1973 and the repression of the labour leaders and historical activists was not strong enough to eradicate Chilean teachers' labour union culture (Nuñez, 2002).

1.4.2 Military period: The fracture of the state as educator and the teacher's union

The military coup d'état in 1973 and the array of educational policies instigated by Augusto Pinochet via the constitution[1]of 1980, with the support of a group of Chilean economists referred to as the "Chicago boys", disarticulated the *state as educator* system and led to a dark future for teachers' professional development and their professional dignity. Pinochet implemented a series of market-oriented economic reforms that dramatically impacted teachers' working conditions, salaries, attitudes towards their profession, and their image as professionals in society (Ávalos, 2003). For example, the government abolished all teachers' unions and created the "Colegio de profesores" (School of teachers), a labour union that teachers were forced to join and whose regulations they had to follow (Nuñez, 2002: 474). In the 80s, teachers' profile was negatively impacted; for instance, their salaries were cut by 38% over 10 years (Rojas, 1998: 169), the school curriculum was controlled, and teachers' working hours were increased to 48 hours a week. More importantly, professional development opportunities became focused on technical knowledge; i.e. teachers were neutralized by instructing them under a pragmatic view of teaching aimed at meeting objectives, which prioritized execution without reflection (Ávalos, 2003; Nuñez, 2002). I remember some senior colleagues at school referring to that period as unfortunate, tough, and difficult for them as it attempted to undermine their morale and dignity as professionals.

Figure 1.2 Signature of the 1980 constitution by Augusto Pinochet

1 The 80s constitution ensured that Augusto Pinochet could remain as President of the Republic for a further eight years with increased powers, after which he would face a re-election referendum. This constitution also promoted a number of neoliberal reforms which affected the economy of Chile through privatization.

Under Pinochet's government, the educational system changed, as decentralized educational authorities took over (Brunner, 1997). The decentralization policy created three kinds of schools: (a) "*public"* schools, supported by public funding; (b) "*subsidized"* schools, supported by a sponsor and public funding; and (c) "*private"* schools (fee-paying schools), supported by sponsors and parents' fees. Other changes involved the creation of SIMCE, an education quality measurement system based on students' performance in several subject areas including mathematics, literacy, and science, and the implementation of a "voucher system" whereby each child received an amount of money (voucher) from the government that could be used by the school that he/she attended (Carnoy, 2003: 309). In my view, the main problem of privatization, SIMCE, and the voucher system regarding teachers' professional development was that education became a business, generating competition, discrimination, and educational inequality in schools. For example, principals and sponsors of subsidized schools enrolled a huge number of students per class –over 45– due to the tempting economic benefits, thus directly affecting teachers' working conditions by reducing training time and adding pressure by requiring them to add considerable innovation to their practices. The decentralized education system was scheduled to end in 2017 with the passing of law no. 20.845, which introduced free school education and abolished subsidized schools and the voucher system (MINEDUC, 2016), although transition has been slow and some subsidized institutions still exist in Chile. Broadly speaking, this law marks the end of co-payment –by parents and the government– in subsidized schools and enables them to become either public or private institutions, in an attempt to regulate the voucher system that had turned education into a business since the 80s.

1.4.3 Transition, Democracy and Current times: The state as educator starts its reconfiguration

The advent of democracy in 1990 brought critical improvements for teachers' professional development under the umbrella of the 90s educational reform and the direct intervention of the government through targeted strategies like the creation of the Teachers' Statute[2], excellence rewards for teachers, the provision of professional development resources in schools (e.g. journals,

2 This regulates teachers in public institutions and defines the requirements, duties, responsibilities, and rights of teachers, while also establishing a minimum wage and bonuses according to a teacher's experience, further training, and difficult working conditions.

daily newspapers, software), pay raises, teachers' networks, scholarships abroad, and the restructuring of the *Colegio de profesores*, which emerged as a democratic and participatory institution (Ávalos, 2002; Carnoy, 2003; Cox, 2005; Nuñez, 2002; Núñez, 1995). These strategies brought back the supportive role of the government in public and subsidized schools (Cox, 2005: 31) and also promoted a change in the image of the teaching profession, causing many young professionals to enrol in teaching programmes, attracted by better salaries and a vast array of scholarships (Carnoy, 2003). During the 90s, the government also implemented (a) *the full school day schedule,* which reduced teachers' workload, helped families to organize their time, and optimized learning/teaching time in schools, and (b) '*ENLACES',* MINEDUC's ICT initiative aimed at enhancing teachers' confidence and technical skills to use computer software in classes (Garcia Huidobro & Cox, 1999: 25). All these programmes and strategies improved teachers' working conditions, embraced collaborative work, and supported the continuity of teachers' professional development through a framework of connected programmes, both online and face-to-face, with the goal of enriching teachers' abilities and their capacities as critical thinkers (MINEDUC, 2017a). Nonetheless, Barahona's (2014) study of a cohort of Chilean pre-service teachers of English in a university teacher education program showed that the instructional approach adopted in universities was strongly focused on training for the achievement of professional competences, as opposed to a more reflective model suggested by the curriculum and conflicting with MINEDUC proposals.

Currently, the teaching profession has slowly recovered the professional status damaged in the 80s and teachers have emerged as critical and active political actors involved in educational and social policies. This involvement has resulted in a strong critique of the newly implemented *teacher's career development* Law no. 20.903, to be fully enacted by 2023 (MINEDUC, 2016). This law includes an evaluation system as an indicator of teachers' performance quality and pedagogical knowledge. It also reduces classroom teaching hours to gradually achieve a 60/40 ratio of teaching to administrative work and creates new standards for selection in pre-service programmes, which are focused on cognitive aspects and vocational perspectives. Additionally, mentoring and evaluation systems are included, with the latter being based on five tiers where teachers progress based on performance and pedagogical knowledge. In this regard, teachers are assessed through content knowledge tests on curricular and pedagogical aspects and through a portfolio that

measures their preparation for teaching and learning, the creation of an environment conducive to learning, and their fulfilment of their professional duties as teachers (Danielson, 2013). This law has elicited strong criticism from teachers, who argue that a tier system promotes individualism, stress, and competition among colleagues, all of which does not translate into professional competence.

In this section, I have traced the trajectory of teacher development history from the establishment of the republic in the 19th century to the present to exemplify the importance and impact of different governments on teachers' education and describe how their policies have either improved or worsened teachers' profile over the years. Currently, Chilean teachers have gradually recovered their historical importance as agents of social change with the power to make significant contributions to society; most relevantly, MINEDUC acknowledged teachers in society as creators of knowledge able to make autonomous decisions on their development. My aim in describing in detail Law no. 20.903, which defines teachers' career development, was to exemplify MINEDUC's newest and main professional development strategy to improve teachers' working conditions, level of performance, and professionalization. This initiative has sparked growing tensions because of its focus on standards, tests, and performance tiers, generating apathy and confusion towards professional development in some teachers.

1.5 Research context

This study is about teachers' professional development; therefore, I expand on today's professional development context by describing MINEDUC's offerings for Chilean teachers in three areas related to this study: collaborative-, online-, and research-focused programmes. I also outline the programmes' practical problems and possibilities regarding technology, collaboration, and teacher education to contextualize my professional intentions. Further contextual elements regarding the Champion Teachers Programme (Smith & Rebolledo, 2018) are also provided. Table 1 below illustrates MINEDUC's main professional development offerings in the last ten years. These programmes are currently in operation and have been classified according to four criteria: (a) training programmes with a knowledge acquisition and skill-oriented focus; (b) development programmes embracing the integral development of teachers through research-based and reflective

approaches; (c) development programmes emphasising collaboration for support among teachers; and (d) online professional development initiatives, which I will review in detail in section 2.4.4 (p.61). These programs are available to teachers working in subsidized and public schools only. PIAP programmes are exclusively aimed at ELT professionals

Type	Examples	Main features
Training with a skill-oriented focus	• Curricular workshops • MINEDUC SIMCE skills development courses • Methodology workshops (PIAP only)	These are short programmes (e.g. a day, a week, a month). Their main purpose is to update teachers' academic and professional knowledge in various areas. Most of these programmes adopt a blended approach, but the face-to-face component in workshops is central. These programmes are developed together with Chilean universities.
Development with an integral focus	• *Champion Teachers (PIAP only)* • ELT methodology courses (PIAP only) • Scholarship abroad 2017-2018	These programmes last one year and include collaborative components in workshops and classes, although they are focused on developing teachers' critical thinking to understand their practices through research-based components.
Development with a collaborative focus	• *Mentoring programme* • *Red maestro de maestros* • SEN/D workshops (PIAP only) • Co-teaching workshops • *Teachers' network (PIAP only)*	These programmes last one year or more. Their main purpose is to promote collaborative work among teachers and the exchange of methodological practices for support. Teachers' participation is voluntary, and they work in teams or pairs with experienced teachers as guides.
MINEDUC online professional development programmes	• Moodle and MOOC blended postgraduate courses • MOOCs from CPEIP • *ENLACES* seminars, workshops and curricular directives	These programmes last between one and six months. Teachers work online in two modalities: full online and blended. Teachers receive an academic certification. Their main purpose is to provide teachers with pedagogical and methodological knowledge regarding how to teach the school curriculum.

Table 1. 1 Professional development programmes in Chile (source: MINEDUC, 2018a)

The professional development programmes available today are the result of over 25 years of consistent and ongoing educational polices. Public and subsidized schools' teachers can enrol in face-to-face and online programmes enriching instructional, curricular, and pedagogical knowledge, along with their capacity to develop more integrally through collaboration and research-based approaches. Training programmes with a skill-oriented focus still play a key role in Chile, orienting teachers about curricular adaptations or new methodological approaches. Mainly, these programmes address teachers' development as prescriptive and informative opportunities to introduce changes to national educational policies, leaving little room for teachers' transformation through reflection, dialogue, or collaborative practice. Research-based and reflective programmes are not equally distributed among subject areas in Chile, with the English

sector –through PIAP– pioneering research-based approaches through action research. It is in this area where perhaps the most representative example of technology-enhanced action research has been implemented in Chile and Latin America: The *Champion Teachers Programme*, developed by the British Council and PIAP (Smith and Rebolledo, 2018). This voluntary year-long programme equips teachers with reflective skills to improve their teaching practices; in it, collaborative work, exploratory dialogue, and pedagogical reflection are the core of its action research design. Its design is based on a flexible and jargon-free exploratory approach suited teachers' dispositions and working conditions. Research work starts with a two-day workshop to create partnerships through social activities, while teachers' research capabilities are fostered via an experience-based approach that includes reflective activities (e.g. grids, posters, experiential account) with the support of a group of academic acting as facilitators of research processes. After the initial workshops, the exploration of the problem becomes critical through teachers' involvement in cycles of planning, acting, and reflection. Here, technology connects teachers through emails, Skype, phone conversations, and a Moodle platform, hence ensuring that collaborative work enables teachers to make sense of their problems before engaging in major interventions. Finally, after a year of work, the teachers reunite in a second workshop to reflect and share their successes and challenges in a seminar-type activity. Since 2013, this programme has reported substantive benefits in terms of teachers' professionalization. For example, teachers' networking with colleagues from different regions in Chile has prevented professional isolation, while the possibility of mentoring subsequent cohorts has fostered the application of action research knowledge and increased professional status. Finally, the opportunity to showcase one's individual action research story in an online booklet made action research knowledge accessible to others in a formal and extensive manner (Rebolledo, Smith and Bullock, 2016; Smith & Rebolledo, 2018).

In the collaborative arena, two programmes –*Mentoring* and *Red Maestros de Maestros*; *Teachers of Teachers Network* (Author's translation)– have been MINEDUC's main collaborative strategy for supporting teachers in the last years. The latter started in 2002, and through the years became the largest nationwide teachers' network, hosting over 4500 teachers who had displayed optimal levels in a portfolio activity (MINEDUC, 2018a). Once in the network, these *maestros* worked collaboratively to develop projects to improve their school communities, which included

methodology workshops, co-teaching projects, and seminars. These teachers are also connected through individual websites for pedagogical exchanges and collaborative work. There is a yearly nationwide meeting to strengthen professional knowledge among them. This programme has greatly helped promote the practice of (online) collaboration among teachers across Chile. However, these opportunities exclude novice teachers, while experienced teachers must work extensively in a portfolio activity before becoming *maestros* and collaborate with other *maestros*. In this area, a more specific programme is PIAP's *teachers' network,* which grants opportunities to novice and experienced teachers to collaborate within their local school communities. Here, teachers meet on a monthly basis to collaborate and reflect on the challenges they face in their teaching, enabling novice and experienced teachers to share material, engage in dialogue, and collaborate without extensive application processes.

The *Mentoring* programme consists of experienced school teachers applying to be mentors who are trained by MINEDUC to support novice colleagues in their schools, with mentors leading by example (MINEDUC, 2018a). In this programme, collaboration tends to adopt contrived dimensions where administrative pedagogical work and asymmetry of relationships are emphasised, preventing more natural immersion opportunities inside the school community. In the collaborative realm, it is important to mention that MINEDUC has supported the emergence of professional research networks such as RICELT or Chile Global, which grant a platform for young researchers to present their work, network with others, and access resources in Chile and abroad. Finally, the online professional development program involves Moodle and MOOC courses to impart pedagogical and curricular knowledge. These courses have expanded considerably in the last years in areas like teachers' wellbeing, reflective practice, and critical thinking, among others, meeting various professional needs and interests and promoting collaborative work in online environments through discussion forums about the contents covered. ENLACES, the ICT initiative developed by the Chilean ministry of education, has supported teachers' online professional development through the provision of technological resources such as Internet access in schools, seminars, blended-programmes, and a variety of directives for online professional work, for example, the ICT standards for the teaching profession (MINEDUC, 2011). These directives suggest how teachers should use technology in five broad dimensions, ranging from the pedagogical use of technology to the ethics of ICT, with the fifth dimension being *professional*

development and responsibility, which stresses the competences of communication and autonomy in teachers' own learning. That is to say, through ENLACES, MINEDUC has established teachers' online professional development as one of the main pillars of technology use in Chile.

In this section, I have described the skill-oriented, collaborative, and research-based approaches to professional development in Chile, while also outlining ENLACES' role in promoting technology use among teachers and supporting their professional practice. I have also highlighted the main action research initiative in Chile for ELT teachers –the Champion Teachers Programme– and outlined some practical problems and possibilities regarding technology use, collaboration, and teachers' education. In this study, I have addressed some of the problems I identified in the Chilean context. The problems I have identified include the imbalance of research-based opportunities for Chilean teachers out of the ELT arena and the limited opportunities for teachers to work together practically without contrived and hierarchical constraints preventing more natural collaboration. In addition, my professional intentions aim to provide professional development opportunities involving research and collaboration to benefit teachers who cannot apply for MINEDUC programmes either due to their lack of experience, belonging to certain subject areas, or working in the private sector. Studies on the online collaborative and professional practices of teachers have been conducted in Chile (Hinostroza et al., 2005; Hinostroza et al., 2013; Morales, 2015; Ibieta et al., 2017), as further expanded in section 2.4.4. (p.61). However, few studies address the collaborative practices and the social and constructive dimensions it involves (e.g. building trust, negotiation, and division of labour) while also covering the ongoing nature of professional development by considering *trajectory* (Dreier, 1999; Rasmussen, 2005) as their unit of analysis. My dissertation addresses this literature gap with a focus on primary and secondary school teachers' uses of wikis when collaborating and the study of trajectories to understand developmental aspects. Finally, I consider that Champion Teachers' professional development model is an example to follow because it outlines flexible, comprehensive, and realistic options to do research with others, promoting collaboration practically and fitting naturally in the classroom, which is where I believe teachers' needs are most pressing.

1.6 Research aims and Questions

The main aim of this study is to explore how technologies mediate the professional development process of a group of Chilean school teachers working online to solve problems of practice, with a focus on teachers' collaborative practices when using a discussion-based technology such as a wiki. Through this, I also explore how teachers approach support, guidance, and facilitation in their developmental processes. This prompts an inquiry into my professional practices as an online teacher educator and facilitator as well. For this exploration, a group of teachers were invited to participate in a professional development offering I designed, crafted, and implemented: The Wiki Project. This project took structural aspects of the Champion Teachers initiative, complementing online and offline components with a research orientation, professional development activities and resources, and continuous support and facilitation online. The study adopted a problem-solving approach to action research to support these teachers professionally. The project aimed at connecting Chilean teachers from different subject areas, with a variety of experiences, and different school realities while also providing a significant opportunity for novice and experienced teachers, working in private and subsidized schools, to engage in research, thus complementing professional teacher education in Chile.

Three research questions frame this exploration;

1. How does a technology-enhanced action research opportunity mediate the process of teachers' professional development?
2. How do collaboration and collaborative practices manifest through the process of professional development of teachers working in a wiki?
3. How do teachers approach support, guidance, and facilitation in the professional development experience?

By proposing these questions, I wanted to get insights into the possibilities and challenges that technologies granted to Chilean teachers immersed in an evolving and demanding educational context and to explore aspects of my professional practices in online environments. Figure 1.3 below presents a timeline of the intervention and an overview of the actions performed by the teachers and myself through the technology-enhanced action research model. Further features of

this model, including the meaning of its thematic stages and its problem-, autonomy-, and experience-oriented focus, are discussed in section 4.2.3. (p.109).

Stage and date	Explanation and main activities
Reflection From July to October, 2015	In this model, *reflection* is embraced in all stages of the model through teachers' reflective logs in emails, narrative components in interviews (e.g. metaphor creation, photo associations, reflective questioning), discussions, or the sharing of material followed by questions in wikis.
Orientation From July 6th to July 24th, 2015	*Orientation* refers to the provision of information regarding the project (e.g. use of a wiki, action research model, research in Chile). I also get access, facilitate developmental activities, and develop an initial understanding of teachers' problems through readings and the sharing of experiential accounts. A first round of online or face-to-face interviews served this purpose.
Identification From July 6th to July 24th, 2015	Identification involves our collaborative work in interviews (e.g. active questioning, metaphor creation, association activities) to identify a problem in teachers' practices. This stage involves us actively discussing experiences and problems to make informed contextual and professional decisions on what to focus on. Afterwards, I identify the core problematic threads in their narrations and organize collaborative teams of 3 or 4 teachers for thematic conversations and collaboration in 3 problem-solving wikis: technology, behaviour, and methodology.
Planning From July 24th to August 28th, 2015	We work collaboratively on a social wiki and on specific problem-solving wikis. In the first, we create a profile and interact to establish relationships with others; in the second, we work for over a month in teams sharing ideas and material to seek solutions to their individual problems. I facilitate online discussions and promote collaboration. At the end of the collaborative activities, I identify the main strategies discussed and invite teachers to work on the most relevant ones for them. Teachers then decide and plan an intervention individually but with the support of their school colleagues and members of The Wiki Project, including me.
Action In September 2015	Teachers implement changes in their practices based on their decisions after the wiki discussions. I provide ongoing support by email during their interventions by inquiring on their actions, reflecting with them, and sharing material.
Reflection From October 5th to October 30th, 2015.	Finally, we evaluate the experience in the project through a second round of interviews (online or face-to-face). We work with visuals, metaphors, and linking and narrative activities for that purpose. I also invite teachers to engage in further development cycles.

Figure 1.3 Action research methodology and timeline of interventions

1.7 Dissertation outline

The study is structured in eight chapters.

Chapter one introduces the aims, rationale, and background of the study, along with my professional intentions. In this chapter, I present MINEDUC's offerings in key areas related to this study, portray the profile of Chilean teachers through history, and outline the action research timeline of the interventions included in this study, which are aimed at exploring collaboration practices in online environments and aspects of my professional practices.

Chapter two presents a literature review focused on professional development and collaboration, also describing their nature in online environments. This chapter argues that collaboration is a key process in teachers' professional development, which cannot be separated from reflection, and that action research and professional development activities provide pertinent frameworks for the emergence of these processes. It also argues that the mediating potential of others and technology provides possibilities –and poses challenges– for online collaboration, while also discussing the links between technology use and collaboration in international and local contexts to address research gaps.

Chapter three discusses the theories and concepts helping me to theorize on the nature of professional development and collaboration. As such, this chapter articulates a comprehensive view of learning, collaboration, and development from specific socio-cultural perspectives.

In *Chapter four,* I present a three-angle framework for design to explore and understand the online professional development process of a group of primary and secondary school teachers in Chile. For this, three sections were needed. *Section one* starts with the methodological angle explaining my worldview assumptions, action research methodology, research questions, aims, my roles, and positionality in this study. Subsequently, *section two* articulates the methods of inquiry including sample, research design, methods of data collection, and ethical issues. Mainly, this section represents my action strategy termed The Wiki Project. *Section three* closes the design triad by explaining the means of data analysis from interaction analysis (Jordan & Henderson, 1995) and thematic analysis (Braun & Clarke, 2006) perspectives. This last section is substantive due to the

complexity of explaining the reconstruction of the social practice of professional development and collaboration through trajectories and interactions.

In *chapter five* and *six*, I present findings in two levels: the trajectory level, through three teachers' professional development trajectories during The Wiki Project, and an interaction level, with a focus on the collaborative activity of three teams working on wikis. These chapters also inform insights into the evolution of my practice in terms of technology use for collaboration.

Chapter seven discusses findings by considering my theories and the existing literature on professional development and collaboration.

I finally present *chapter eight*, which concludes this study with an overview of key findings, contributions to knowledge, implications for practice, strengths, limitations, recommendations, and my final reflections on my learning journey.

Chapter 2: Literature Review

Teachers' professional development, collaboration and online professional development

Introduction

This chapter reviews the literature on the main areas of this study, namely *teachers' professional development, collaboration,* and *online professional development*. I start with a definition of professional development covering its meaning, aims, and components, while also pointing out why it is necessary for teachers; then, I present historical perspectives and their links with collaboration and reflection. Here, I expand on the mediating role of others (e.g. peers, facilitator, and critical friend) as sources of stimuli and support for directing reflective and collaborative processes through professional development activities and action research. This supports the rationale of The Wiki Project and also unifies the current understanding of the main features involved in the professional development process.

I then turn my attention to the role of technology in the professional development of teachers with a focus on collaborative activity. To do this, I review the possibilities of technology and the barriers hindering it, paying special attention to the use of wikis. This is relevant because wikis, as this study shows, support online professional development. This chapter finishes with a review of key international and local studies addressing online professional development, which is followed by a discussion of the gaps identified in order to present an argument justifying this study.

2.1 Professional development: Definition and key issues

A common feature defining professional development concerns its procedural nature, although authors have largely failed to provide definitions of its development path and the collaborative and reflective components of its processes.

Traditionally, teachers' professional development has involved short-term in-service courses or seminars to equip teachers with the skills for teaching. Hoyle and John (1995: 17) defined professional development as the process whereby teachers "obtain the knowledge, skills and values" to teach. This is a traditional view, focused on the acquisition of teaching skills to satisfy

instructional needs. Similarly, in 2009, the OECD defined professional development as the growth of "an individual's skills, knowledge, expertise and other characteristics as a teacher" (p. 49). This definition, by acknowledging expertise, presupposes a more practical and dynamic process, not necessarily in a training seminar or short course. Malm (2009: 77) moved in a more essentialist direction by simply regarding professional development as the development of the "whole person", i.e. considering its intellectual, social, and emotional aspects. Ávalos (2011), who has greatly contributed to professional development knowledge in Chile, also paid attention to the development of cognitive and emotional aspects of teachers; furthermore, she directly embraced the value of collaboration and reflection as interactive and inquiring components for improvement in teachers:

"Teacher professional learning is a complex process, which requires cognitive and emotional involvement of teachers individually and collectively, the capacity and willingness to examine where each one stands in terms of convictions and beliefs and the perusal and enactment of appropriate alternatives for improvement or change" (p.10).

Broadly speaking, the aim of professional development has been linked to teachers' change (Hargraves & Fullan, 1992; Evans, 2002; 2014), also regarded as a transformation (Kennedy, 1995), signifying improvements in teachers' classroom practice to satisfy learning conditions more effectively. This change presupposes the pursuit of status-related elements of teachers' work such as autonomy, self-efficacy, leadership, reflection, and collaboration, which happen over time.

Hargraves and Fullan (1992) suggested that ecological changes –i.e. attitudinal development in work performance– did not happen overnight, simply because understanding requires time. In the same vein, Scott (2010) acknowledged the importance of time for engaging teachers in professional development processes, instilling commitment, comfort, and reflectiveness in the learning experience. Current views (Burns, 2015; Prestridge, 2017) acknowledge the behavioural, attitudinal, and intellectual change enhanced by timely research-based approaches to professional development, along with equating timely change with development. Here, it is worth noting that time –the length of professional development experiences– had been regarded as the component creating qualitative shifts in aspects of teachers' professionalism. For example, extended professional development programmes lead to enduring reflection in and on practice (Finlay, 2008;

Mann & Walsh, 2017), grant opportunities to participate in communities and become part of them (Fuller, 2007), and suggests possibilities to put into practice skills and knowledge as well as values (McNiff, 2013).

Professional development is always a situated and mediated process. It is situated because it occurs in various settings (Helleve, 2010), which include direct teaching (e.g. university courses); learning in school (e.g. mentoring) and action research; learning out of school (e.g. online); and learning in the classroom (e.g. reflection in action). It is also mediated because it involves another person (e.g. a facilitator, a critical friend, a colleague) who can stimulate or guide learning though the use of questions, resources, language itself, or professional development activities (Shabani, 2016). In this regard, relevant elements include the rise of the Internet in the early 90s and the explosion of interactive technologies, both of which opened possibilities to mediate remote professional development (Crook, 2011). Here, one focus of interest for teachers' professional development has been collaborative activity in online settings like wikis and discussion forums, which is one of the main topics of this study (for more details, see section 2.4.3 p.56).

Lastly, the evolution of educational policy along with research in teaching and learning, have justified the need for professional development. For instance, traditional educational policies were primarily concerned with instructing contents and the acquisition of skills, thus promoting visions of professional development that defined teachers as recipients of information with little autonomy in their development process (Kumaravadivelu, 2012). Over time, educational research has influenced these policies by stressing the importance of collaboration for the construction of learning in the classroom, seeing students as knowledge builders and teachers as facilitators of learning (Bereiter & Scardamalia, 2014). That is to say, the need for permanent professional development –to accommodate the socio-educational needs and contextual realities of societies over time– requires seeking effectiveness in teaching. In this regard, for example, Chilean school teachers received computer skills training in the 1990s as part of a nationwide reform through the ENLACES project, which added ICTs to the school curriculum (Ávalos, 2010). These initiatives encompassed collaborative and school-based approaches to professional development where training took place in schools and teachers worked in groups in/around computers, learning their uses in collaboration with others. This approach reflected worldwide trends, which were especially

strong in Europe (Donoso, 2005), and was strengthened by the reinstatement of democracy in Chile.

In this section, I defined professional development as a situated process that can happen, for example, in a school, and that leads to the acquisition of skills, pedagogical knowledge, and professional abilities, being first and foremost aimed at the lifelong development of the teacher as a whole person and a professional. This process involves reflective and collaborative aspects, both of which are essential and indispensable for professional development, with engagement in them promoting changes in teachers' attitudes, cognition, and behaviours. I summarily discuss how people and technology can mediate the professional development process, while also exemplifying how the socio-cultural and educational contexts impact the nature of professional development. In essence, I delve into the key area of this study: *collaboration* and its links with online professional development, which I review in detail in the following sections.

2.2 Professional development: Historical approaches

The term "profession" comes from the Latin word *profiteri,* meaning to declare in public; as such, a "profession is an occupation in which one publicly declares a skill" (Mitchell, 2013: 388). Evans (2008; 2014), who has widely studied the epistemological divide between professionalism and professionalization in teacher education, suggested that professionalism is linked to professional development because it represents the reality of daily practices (Evans, 2008). As such, teachers' professionalization involves a "practice that is consistent with a commonly-held consensual delineation of a specific profession"; i.e. professionalism reflects the ideological beliefs of the teaching profession, the attitudinal disposition manifested in teachers' values, and the intellectual stance of ideas regarding the profession (ibid:13).

The pursuit of teachers' professionalization is addressed in several models of professional development, seeking the emergence of positive characteristics along with best practice. Early professional development models such as the one described by Wallace in the 1990s or Kennedy (2005) years later, including craft, transmission, and applied science models, highlighted the acquisition of teachers' capabilities through the transmission of information (Kumaravadivelu,

2012), prioritizing knowledge acquisition and sidelining collaboration or technology use as strategies for professionalization. Furthermore, these models seldom acknowledged features of effective professional development highlighted in recent literature. For example, there were few connections with teachers' experiences with students to elicit collective understanding from issues in the classroom (Wright & Beaumont, 2015) and few opportunities to work with others, thus preventing collaborative cultures of openness, trust, and support among teachers (Forte & Flores, 2014). Moreover, references to the teaching context were not acknowledged in a practical way, generating irrelevant solutions to teachers' problems (McNiff, 2013). Currently, Prestige and Tondeur's (2015) online professional development study with Australian teachers, Mahapatra's multiple technology professional development study in India (2015), and the Champion Teachers (Smith et al., 2018) action research experience in Chile revealed that the inclusion of contextual, collaborative, experiential, and technological aspects in the professional development experience give teachers autonomy in their learning, support specific needs, and provides them with hands-on experience before implementing changes in their classes.

Shabani (2016) argues that the rise of socio-cultural approaches to teaching and learning manifested itself through the emergence of transformative models of professional development, which took key Vygotskian theoretical concepts like social interaction, internalization, mediation, and psychological systems –as further discussed in section 3.1 (p.66)– to promote collaborative learning experiences like workshops, seminars, mentoring, and portfolio activities. These new professional development models promoted attitudinal, behavioural, and cognitive changes (Hargraves & Fullan, 1992; Guskey, 2002), hence impacting:

(a) "the classroom practices of teachers" (e.g. by promoting reflection in practice)
(b) "their attitudes and beliefs" (e.g. by promoting collaborative approaches to learning)
(c) "the learning outcomes of students" (e.g. by applying the learning gained with others in a practical way)

(Guskey, 2002: 383)

Based on this idea, professional development authors started to speak of a transformation that gave teachers autonomy and control over their learning and granted them the opportunity to learn from each other without depending on outside experts (Altrichter & Posch, 2009; Somekh, 2010).

Hence, this new approach highlighted the importance of collaboration and reflection as the main processes of professional development.

2.2.1 Collaboration and collegiality

The concept of collegiality was coined in teacher education to describe the collaborative actions teachers adopt in their workplace. In this section, I review different meanings and interpretations of the concept. Little (1990) distinguishes four forms of collegial relations ranging from independence to interdependence, including *storytelling* and *scanning for ideas*, *aid* and *assistance*, *sharing*, and *joint work* (p.512). Here, the telling of experiences is regarded as having little impact on collaborative activity; rather, it is suggested that it mainly involves building trust within a group or sharing information about aspects of teaching practice. For their part, aid and assistance refer to requesting help, which is problematic because it can be regarded as a lack of competence. The sharing of material is more collaborative because it invites other colleagues to engage in conversation while also opening opportunities for inquiring about the material shared. Finally, joint work tacitly assumes a process of construction where people decide goals together, share responsibilities, and work together to achieve more than can be achieved individually (Barfield, 2016), although joint work is subjective because someone can take over or rely on others, unbalancing the effort. Hargreaves (1994) separates collegiality into two types: *contrived collegiality and collaborative cultures.* The former mainly concerns administrative, compulsory, and predictable impositions in a school that lead teachers to work with others in fixed time and space. This involves a top-down approach to collaboration dictated by collaborative requirements within a school. In contrast, *collaborative cultures* stress the spontaneous, voluntary, and unpredictable nature of collaboration leading to development in pervasive time and space exemplified by, for example, informal conversations to address problems of practice or networking with teachers from inside or outside the institution. In this regard, Hargreaves (1994: 253) claims that collaborative cultures and contrived collegiality can exist in the same organization, though a contrived collegiality culture does not lead to "meaningful" change, a situation which he links to the socio-cultural challenges affecting education. Kelchtermans (2006: 221) also establishes a conceptual division between collegiality and collaboration, though advancing a more integrative vision of the concepts. This author states that collaboration refers to cooperative "actions", i.e.

teachers actually doing things together for job-related purposes, while collegiality refers to the "quality of relationships" among staff in a school (e.g. autonomy, confidence, and commitment to collaborate). For him, collaboration and collegiality mutually constitute and reflect one another, because both "their appearance and meaning" may develop and shift over time (ibid).

These definitions frame the positive meaning and benefits of collegiality and collaboration for teachers' professional development. Yet, the ultimate benefit resides in improving students' achievements, behaviour, and attitudes toward learning. Little (1990: 177) claimed that collegiality has special benefits for novice teachers in terms of "moral support and emotional solidarity" because expert teachers can influence their younger colleagues with examples, respect, and mutual assistance to improve their classroom proficiency, hence promoting self-confidence when teaching. Hargreaves (1996) also adopts a morally-based perspective, although with an emphasis on the efficacy that leads teachers to be open to new forms of teaching and take advantage of the expertise of others. Finally, Kelchtermans (2006:221) claimed that "collaboration and collegiality do not happen in a vacuum", because they require an attitude of openness to the concerns and successes of others and, more importantly, an attitude that helps teachers to avoid isolation through community involvement.

Wenger's (1998) communities of practice theory is the strongest influence on research on the topic of community in teacher education. According to this theory, professional development is a social practice because it involves understanding how people (such as teachers) become meaningful for each other's development through their participation in learning, as further expanded in section 3.2 (p.74). As such, collaboration is at the core of the social practice of professional development because it continuously affects the meaning negotiation process. Therefore, one of the main benefits of collaboration for professional development is the establishment of communities of practice-based approaches (Hennessy, Haßler, & Hofmann, 2016). A major trend in community literature refers to school communities, although definitions cover various subsets, one of which concerns deep, regular, systematic, and sustained inquiry, classified as professional learning communities (Katz, & Earl, 2010). These include research networks where teachers can engage in research, publish their findings, or participate in self-organized seminars for professional debate (e.g. red RICELT). Other definitions focus on engagement through collaborative professional

relationships among teachers, regarded as school communities; for example, teacher networks for sharing material and experiences such as MINEDUC PIAP teachers' network programme or the Red maestros de maestros (see section 1.5, p.22). Despite these differences, the collaborative impetus is central for community formation through *partnership*, involving reciprocal commitment and sharing to change; *emotional investment*, or the emotional commitment toward improving teaching; *trust*, where the parties rely on each other's competence and willingness to help, and *risk taking*, based on challenging one's learning in collaborative inquiry (Day, Hadfield, & Kellow, 2002). Some considerations on the online features of communities are addressed in section 2.4.2 (p.52).

In this section, I reviewed literature on collaboration and collegial manifestations in school settings. I have also presented several interpretations of collegiality, although the affective and supportive intents reside at the core of its various meanings, influencing collaborative practice. I noted the importance of collaboration and collegiality for community formation, which I argued grants enormous possibilities to support teachers' work –at schools and at a research level– in terms of practical, symmetrical, and affective support for knowledge emancipation and construction.

2.2.2 Reflection and reflexivity

Authors have struggled to define reflection in connection with professional development. In this regard, Hatton and Smith (1995) indicate that the ill-definition of the concept derives from a rather loose understanding of what reflection entails. Likewise, Finlay (2008: 1) claims that lack of clarity in the concepts leads to unreflective attempts to "rationalize existing practice". Bolton (2010: 13) goes one step further by demystifying the epistemological tension between reflection and reflexivity by suggesting that reflection involves "looking at a whole scenario from as many different angles as possible" (ibid:13). For example, a teacher reflecting may consider how students' learning is affected by his/her actions, the activities involved, or the classroom setting in order to review and relive the teaching experience and gain insight about something not noticed yet critical to understand. To do this this, the teacher may need to permanently question his/her practices. In contrast, reflexivity is a personal stance that moves the person further towards

practical problem-solving. It involves understanding our role in relation to others to gain awareness of the limits of our knowledge. So, it is centred on our beliefs, values, and identities; more importantly, it refers to how those personal features are affected by the cultural and social structures we live in. Thus, the same teacher may think about the reasons that led him/her to observe those aspects of practice and not others, or what teaching values directed his/her decisions or feelings perceived in the process.

Reflection has multiple levels of depth which are not necessarily viewed as increasingly desirable for achieving a natural thinking process, which is therefore not linear (Mann and Walsh, 2017). Broadly speaking, professional development literature suggests three levels. The first is a descriptive level where teachers describe, judge, and assess their performance based on imposed criteria (Hatton and Smith, 1995). Here, authors like Valli (1997) and Kreber and Cranton (2000) suggest reflection involves a technical process where teachers judge their teaching performance on the basis of externally set criteria and tend to describe situations. The following is a more advanced level that includes attempts to understand concepts, ideas, and alternative solutions for teaching concerns (White, Fook, & Gardner, 2006). For example, teachers can address aspects of students' lives, personal desires, concerns, and hopes in a rather relational focus or make decisions based on their experience, colleagues' opinions, and personal beliefs, although further evaluation is not considered (Valli, 1997). The final level is of a critical nature, and involves systematic inquiry and evaluation to create knowledge, along with a social and political analysis of situations leading to transformation (Finlay, 2008). Here, Kreber et al. (2000) regard self-criticism as an aspect of critical reflection.

There are multiple reflective models to support professional development. One is Gibb's (1988) reflective cycle, comprising a six-stage process to scrutinize a classroom situation from different angles. For example, teachers described a situation to then express their feelings, evaluate actions, and draw conclusions for designing an action plan. This model is a practical way of eliciting reflection in an orderly way, nonetheless, its procedural format needs to be approached cautiously because one can easily just go through the motions of expected actions in reflection rather than engage in the process itself (Mann & Walsh, 2017). Similarly, the traditional reflective model of Wallace (1991) describes teachers as engaging in a reflective cycle that involves practice and

reflection based on their previous experience (e.g. as students or teachers) and new experience (e.g. in the training room), which leads to increased awareness that informs professional competence. Kostiainen and colleagues' (2018) study in a Finnish university teacher education course illustrates the features of this model by reporting the meaningful learning experience of 76 students attending a communication course. The participants wrote reflective essays about significant phenomena they experienced in the course. They were free to share their reflections and choose any situation considered meaningful, but they were compelled to draw on literature to address the theory-practice divide through reflection. Findings showed that participants adopted daring and risk-taking attitudes when urged to confront their discomfort zone and discuss difficult topics. Becoming mindful of the impact they had on the learning of others and more able to express emotions also emerged as themes, along with the capacity to trust their colleagues, feeling accepted, valued, and important to each other. All in all, these findings evidenced the connection between reflection and collaboration in teacher education. For example, the relationships among the participants during the task opened possibilities for expanding their perspectives; mostly, they developed mutual respect and supportive professional relationships, confirming that teachers grew professionally through interaction with others (Hargreaves, 1994). Here, trust, feelings of acceptance, and importance to each other did not come out of nowhere. They emerged after teachers reflected, which enabled them to understand that collaboration was a means to overcome isolation by establishing interpersonal ties and relationships, impacting mutual development in a collegial way (Kelchtermans, 2006).

In summary, the various definitions of reflection mentioned above have made it difficult to develop a unified understanding of its meaning in practical terms. Nevertheless, several perspectives (e.g. Hatton & Smith, 1995; Kreber et al., 2000; Bolton, 2010; Mann & Walsh, 2017) have shed light on its conceptual divides, levels, and nature, making it possible to understand and enable aspects of teaching practice. Here, a variety of reflective models have emerged which suggest that reflection can be elicited, shaped, and guided. Nonetheless, a word of caution (Mann and Walsh, 2017) invites us to address these possibilities not too rigidly, trying not to structure a natural thinking process. In this review, I have exemplified the intrinsic reflection-collaboration relationship through Kostiainen and Colleagues' (2018) study, which suggests the importance of others for improving learning through engagement in reflective processes. This idea is important

for the theoretical underpinning of professional development in my study; therefore, it is expanded in section 3.4 (p.84).

2.3 Mediators of the professional development process

I understand mediators as the human means and cultural artifacts (such as technologies) that facilitate, guide, and stimulate teachers' professional development process for improving professional practice (see section 3.1.3, p.71). In this section, I review literature about *the role of others* (e.g. facilitator, critical friend, other teachers) as sources of stimuli and support for guiding reflective and collaborative processes through professional development activities and action research. I later elaborate on the role of technology in mediating teachers' professional development processes and its links with collaboration (see section 2.4, p.48).

2.3.1 The role of others in professional development processes

During the 1970s, training was the main professional development approach, so contents were generally delivered by an expert who generated a plan to be followed (Kumaravadivelu, 2012) and who supported teachers by selecting, organizing, and designing or just delivering contents by following preset goals. Currently, professional programmes merge training and development approaches where dialogue or talk with peers about professional experiences fuel teacher development (Wright & Beaumont, 2015). Hargreaves (1994) suggested that working with peers at school softens power relationships, enabling teachers to express ideas with confidence, respect, and trust to develop their expertise with one another. Barfield (2016: 22) added that working with peers in informal situations (e.g. talking with colleagues between classes, sharing experiences and stories in breaks) "helps build open, trusting collegial relationships", also indicating that voluntary and spontaneous work supports productivity and motivation. In this vein, de Vries, Van de Grift & Jansen (2014) conducted a comparative study on 260 secondary teachers to explore the relationship between their beliefs about teaching and learning and their participation in teacher education programmes. Teachers completed a survey that focused on their interest in updating, reflective, and collaborative activities in professional development programmes. Findings showed significantly more participation in updating and collaborative activities than in reflective ones.

Specifically, sharing new teaching ideas with colleagues, the opportunity to plan lessons together, and experimenting new teaching methods together were the collaborative practices that teachers valued most. All this suggests that working with others in formal and informal situations has a positive impact on teachers' motivation and attitude towards learning.

Mentoring is based on the notion that a one-to-one relationship, generally between an expert and a novice teacher, grants possibilities for acquiring skills, knowledge, and socio-cultural norms within an institution (Kennedy, 2005; Shabani, 2016). This allows dialogue about possibilities in class and team work in a less hierarchical way as in, for example, the MINEDUC mentoring programme in Chile (see section 1.5, p.22) where experienced school teachers provide a novice teacher with formative support. Here, the idea of education and not evaluation entails a self-confidence boost, improvement of attitudes toward teaching, and the construction of a collaborative school culture (MINEDUC, 2018a).

In action research literature, having a critical friend is mostly addressed in relation to (a) his/her developmental role in the professional development process and (b) his/her position as an insider within the professional development experience (Elliot, 1985; 1991; McNiff, 2013). Elliott (1985;1991) suggested that a critical friend supports research stages (e.g. helping in planning), stimulates motivation to work through encouraging comments, contributes with alternative ideas, and creates opportunities for the various agents of the professional development process to engage in dialogue (e.g. organizing discussion groups). McNiff (2013: 105) supported these visions and added that a "critical friend" can be a colleague who provides support and company by observing and monitoring actions, providing feedback on decisions, or making suggestions about research actions. By contrast, professional development literature refers to facilitation, *per se* a facilitator: a more technical and outsider role to facilitate *progression* in teacher education processes. In fact, while reviewing literature, the word facilitator emerged with reference to teachers receiving support from universities and teacher educators to achieve tasks (Ponte, Beijaard, & Wubbels, 2004; Biasutti & EL-Deghaidy, 2015) or a researcher guiding and supporting managerial aspects to organize learning resources (Lai & Ng, 2011). In my opinion, this is a view that not only eases developmental processes, but also –more importantly– introduces special considerations in online environments as reviewed in section 2.4.2 (p.52).

As shown in this section, the role of others has been historically acknowledged as an important component of the professional development of pre-service and in-service teachers. Although these roles have shifted from a more directive stance to a more constructive one-to-one relationship, the impetus of working with a peer has evidenced significant improvements in professional attitudes and cognitive levels over the years. As reported in a comparative study conducted by de Vries et al. (2014), teachers prioritize and are aware of the possibilities of working with others; thus, I suggest these practical possibilities are always framed in a professional development experience such as training, mentoring, action research, and informal or formal interactions. Hence, it is pertinent for my study to review how action research and professional development activities facilitate social interaction (see section 3.1.2, p.70) and therefore provide a context where collaboration, reflection, and professional practices emerge.

2.3.1.1 Action Research: A framework for professional development

The evolution of professional development over the years led to the emergence of varied pathways for teachers' professionalization (e.g. mentoring, collaborative inquiry, colloquia), with action research perhaps being the most significant framework for school teachers to embrace an independent learning pathway to construct significant meaning, address problems of practice, or develop research skills in a collaboration with others (McNiff, 2013; Prestridge & Tondeur, 2016). McNiff and Whitehead (2006) claim that doing action research helps renew practice and theory and, more importantly, that it enables one as a practitioner to see oneself as both practitioner and researcher in order to value one's work and its importance for generating new practice and knowledge. For me, this idea hints at the impact of action research on the developmental change of teachers; that is to say, while doing action research, a teacher positions him/herself in a different professional role from where he/she can examine practices directly, make contextually-aware decisions, and broadly embrace a new attitude towards professionalization. However, engaging in this process does not equate to working in isolation, because doing action research involves "mobilizing and energizing" others to engage in a process of change through encouragement and conviction –not to do things differently, but to do things with others while also recognizing opportunities in problems and convincing others to address them together (Danielson, 2006: 12).

All the above features are addressed in the literature on teachers' leadership that I have used to exemplify the collaborative dimension of action research, along with the attitudinal and behavioural changes it can trigger in teachers, such as leadership.

Whitehead (1985) suggested that action research is a process of living out your values to satisfy the living contradictions or neglected professional needs imposed by society. Thus, doing action research not only involves a constant effort to balance your own values with the people you work with (e.g. contributors, participants), but also a decision-making process regarding the values you want to live by and why (McNiff & Whitehead, 1996). For me, this idea directly targets the professional and attitudinal transformation that action research engenders in teachers, which evolves and emancipates in the ongoing articulation of values and actions.

Over the years, several approaches to action research have emerged to address teachers' needs and their problems of practice by embracing reflective and collaborative actions. Of those, *exploratory* action research (Allwright, 2015; Smith, 2015), has envisaged teachers' development in the critical understanding of their problems, hence encouraging teachers to review pertinent theories and reflect on their problems or puzzles more actively before engaging in action (Allwright, 2015). This approach emerges from Exploratory Practice (EP), an inclusive form of practitioner research aiming to use "class time to deepen understanding of what language learning involves" (Allwright, 2015: 26). In this context, exploratory action research has emerged as an alternative to action research's problem-orientation by focusing on understanding why problems arise and, consequently, placing emphasis on exploring 'puzzles' rather than solving problems directly when starting research (Allwright & Hanks, 2009). In addition, exploratory action research proposes making research an integral part of teachers' daily lives, hence pertinently addressing issues of unequal participation in research processes. Another approach is classroom action research. Here, Altrichter, Posch, and Somekh (1993) comment that this approach grants practical possibilities to reflect more deeply and systematically on teaching practice because it happens in the teachers' school context. In addition, various models of action research have also offered a comprehensive and structured possibility for novice and experienced teachers to engage with their thinking and collaborate with others. Among these models, Kemmis and McTaggart's (2000) four-stage cycle encourages teachers to examine a specific problem of practice by then planning a strategy,

implementing actions, observing the problem identified, and reflecting on it. Although this model has been questioned for the lack of reflection and flexibility of the original idea (Hopkins & Ahtaridou, 2008), I argue that it constitutes a clear induction to action research and reflexive practice for novice teachers. In this regard, the earlier model advanced by Elliott (1991) includes "a reconnaissance –fact-finding and analysis– within each stage of the action research" (Koshy, 2005: 5), hence addressing reflection in two ways: reflection in and on action (Schön, 1983, 1987). Therefore, reflection in this model is part of all stages, supporting ongoing self-awareness of teachers' practices. Finally, a less tidy model was designed by McNiff (1984), as presented in figure 2.1 below.

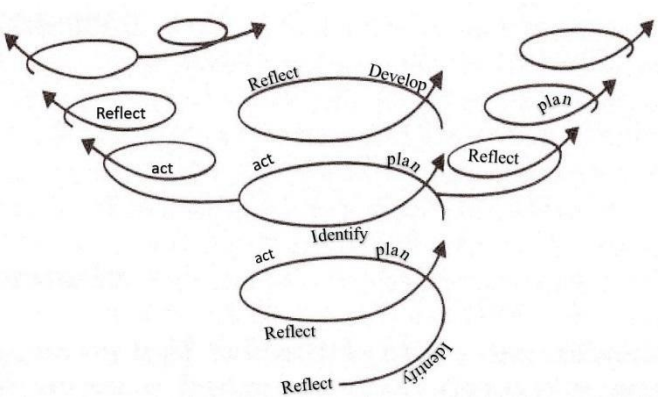


Figure 2. 1 McNiff´s generative action research model (adapted from McNiff, 2013: 66)

This spiral model is useful for teachers because it reflects the cyclical, changing, and ongoing nature of action research, which resembles the organic social processes inside the classroom and thus illustrates the impact of the context; in other words, this model promotes critical thinking through the understanding of teachers' social situations and relationships with others during the research process.

Overall, these approaches and models highlight the inclusion of reflective and collaborative components bridging practice with understanding for professional development. Interestingly, reflection is emphasised differently in the models: while Kemmis and McTaggart (2000) represent reflection as a stage, McNiff (1984) and Elliott (1991) portray reflection recursively in the process. This suggests that some models adopt a more practical orientation regarding the improvement of teaching conditions, relationships with students, ways of teaching, and other elements. Meanwhile,

others emphasise the development of teachers as reflective practitioners, establishing that it is perfectly legitimate to follow different goals.

Technological advances make action research easier, quicker, and more feasible, especially when practitioners are working together (Mann and Walsh, 2017). Essentially, technology can promote research processes by mediating them, hence bridging the limitations imposed by distance and enabling researchers to collect data, contact participants, or access various resources easily. McNiff (2013: 179) describes the potential of technology for action research projects by emphasising the "unlimited creativity, connectivity, and communicative action" it offers researchers. In this regard, I found that studies on professional development programs based on technology-enhanced action research in Chile and abroad reported both benefits and challenges. The former broadly address possibilities for controlling the nature and timing of support activities (Prestridge & Tondeur, 2016) or the feasibility of creating products remotely (Burns, Westmacott, & Hidalgo, 2016), while the latter report attitudinal dispositions towards technology (Smith, Connelly, & Rebolledo, 2014). Summarizing, I have reviewed literature about the potential of action research models and approaches for embracing collaborative and reflective practices. These collaborative practices involve the development of research skills (e.g. planning and collecting data collaboratively), the empowerment of decision making with others, and basically the implementation of changes for improvements with the support of others. I have also explained how action research promotes changes in attitudes and the expression of professional values in teachers, with technology facilitating research processes of connectivity, sharing, and collaboration, although teachers' attitude toward technology use needs to be considered.

2.3.1.2 Professional development activities

Training tasks (Parrott, 1993; James, 2001) or professional development activities (Richards & Farrell, 2005; Wright & Bolitho, 2007; Wright & Beaumont, 2015) –my preferred term, because it implies development rather than instruction– are widely addressed in the literature as stimuli for learning purposes in professional development pathways at both in-service and pre-service levels. James (2001) claims that training tasks help support criticality, the expression of beliefs, and values. For example, Wright and Bolitho (2007) suggest that thinking questions invite participants

to examine their own learning, beliefs, and feelings while also creating links with classroom practices, hence promoting reflection in teachers. In addition, these authors suggest that metaphors and visuals (e.g. photos), which are widely applied in narrative approaches to unveil emotions, thoughts, and interpretations (Chase, 2005), can support emancipation by encouraging teachers to see things differently, express thoughts that had remained hidden, or simply express their inner voices. Richards and Farrell (2005: 14) claim that teachers need to take part in such activities because they are central to "self-direct learning" through inquiry, self-appraisal, experience, personal construction, contextualization, planning, and management. More importantly, these authors suggest that despite self-direction, professional development activities must also be *achievable* (i.e. understandable and uncomplicated for teachers including clear prompts, stages to follow, and a realistic time frame); *goal-oriented* (involving a problem-solving component for teachers' engagement through a sense of achievement); *collaborative* (encouraging participants to share their interests, needs, or concerns, and hence promoting trust leading to collegial relationships); and *reflective* (involving aspects of learning such as connections to experiences, expansion of perspectives, and personal introspection) (Richards and Farrell, 2005). In the latter regard, Richards and Farrell propose keeping an electronic or paper "journal" (p.61) as a record of classroom events and observations and suggest that sharing it with others (e.g. peers, supervisors) can benefit the emancipation of thought. However, they note that reflections are mainly private and not easy to share with others, since this can be perceived as a form of evaluation.

In brief, professional development activities lay the groundwork for eliciting reflections in teacher education pathways by mainly self-directing and structuring teachers' ideas in meaningful and collaborative ways. These activities, as well as action research, can orchestrate a contextual framework for teachers' learning that will enable the mediating potential of others (e.g. peers, mentors, critical friends) to become meaningful for the teacher's professional practices. Ultimately, this meaning emerges from the reflective component that collaboration and self-direction trigger.

2.4 Online professional development: Overview

Perhaps, the main "non-human" mediational means of professional development processes over the last decades, along with books, is technology (Wells, 2000: 16). Technology as a concept adopts different connotations, for example, it can be a tangible device (e.g. computer), an intangible system like a wiki, or even a method (e.g. flow diagrams). Despite these differences, technology plays a practical role in the advancement of knowledge by providing channels of information and communication among people (Crook, 2011). This is of particular relevance for my study as it explores technology's mediational potential for teachers' professional development. In this context, my operational definition of online professional development involves any technologically-mediated form of professional development a teacher engages in (Elliott, 2017) for constructing meaning, solving problems, obtaining support, or supporting others through interaction with content and other people (such as a facilitator or colleagues). Here, my definition involves technology use beyond the online dimension; for example, I consider that using videos, tape recorders, or podcasts to understand aspects of professional practice also represents technologically-mediated professional development opportunities for teachers.

Over the years, online professional development has expanded the scope of face-to-face pre-service and in-service teacher education by bridging geographical distances, hence allowing teachers develop beyond their physical settings (Hennessy et al., 2016). In consequence, the sharing of pedagogical ideas with others, the creation of educative resources, the possibility to store and track reflections, engagement in ongoing developmental processes, or simply the sharing of interests along with resources became internalized and standardized practices in most pathways of professional development worldwide (Prestridge & Tondeur, 2016). Here, various technologies (e.g. emails, wikis, e-portfolios, online conferencing systems, and blogs) support specific aspects of the social practice of professional development, acting either as a complement of face-to-face professional development programmes or as a whole technological experience involving no physical contact. A clear example of the first modality is UNESCO's (2017) *supporting teachers with mobile technology* project, which enhances Mexican and Pakistani school teachers' language and pedagogical knowledge through the use of blogs and Facebook respectively. In this programme, teachers first build awareness of mobile learning in workshops and school visits to

later include online components in blogs for knowledge sharing with their colleagues. Similarly, Mahapatra (2015) presents a whole technologically-based professional development offering that mixed Facebook, electronic portfolios, and Google sites to familiarize Indian multi-level teachers with technologies. Interestingly, both experiences report positive perceptions toward technology use resulting from novelty, motivation, and convenience.

Crook (2011) comments that online professional development provides opportunities for formal and informal learning, suggesting possibilities for addressing educational problems, networking with others, creating learning resources, sharing material, and building knowledge in ways akin to those observed in a face-to-face course. Formal online professional development is exemplified by initiatives embracing educational standards, hence adopting a more structured dimension (Lutrick & Szabo, 2012) and usually involving the achievement of certifications. In contrast, informal learning involves, for example, the establishment of online communities where teachers can voluntarily engage in shared learning and reflection, exchange professional interests, or receive emotional support (Macià & Garcia, 2016). This informal experience is usually less structured, although it promotes confidence and engagement in a more natural approach to professional development (Eraut, 2011).

So far, I have presented literature that shows online professional development is an option for teachers' development because it complements their learning trajectory with possibilities for remote collaboration and reflection with others. Here, technology facilitates the diversification of professional development options ranging from its full use to a blended modality in formal and informal approaches to development, with all these modes representing a significant option for teachers. My goal now is to expand on the technological possibilities described in the literature by addressing the collaborative and creative potential of technologies for professional development, along with some challenges that online professional development poses to teachers.

2.4.1 Technologies for online professional development: Possibilities and challenges

Technologies such as emails, wikis, and video conferencing link collaborative learning and online learning, supporting teachers' development by mainly bridging distance communication and

assisting the delivery of information (Crook, 2011). This connection gave rise to two research perspectives over the years: one that focused on the interaction of participants in a computer-based communication medium, termed computer mediated communication (CMC); and another focused on learning in collaboration with the support of technology, namely computer supported collaborative learning (CSCL). This study falls in the latter category, although it focuses on teachers' collaborative practices and not on those of students as CSCL research frequently does (Stahl, Koschmann, & Suthers, 2006); that is to say, this study explores a group of teachers' collaborative practices aimed at furthering their professional development in a computer-based communication medium (i.e. a wiki).

Technologies have been widely used to enhance online collaboration in professional development programs for teachers, making it possible to explore the interactive factors improving or limiting teaching practice. Thus, research on peer/collaborative assessment (Lai & Ng, 2011; Ng, 2016), collaborative writing (Wheeler & Wheeler, 2009; Brox, 2017), or collaborative lesson planning (Salajan et al., 2016) has explored the constructive potential of technologies (e.g. wikis and discussion boards) for creating something with others in a setting where online interactions serve the constructive process. This work has also examined thinking processes with a focus on how other(s) trigger emancipatory perspectives, an approach exemplified by Hall's (2018) or Granberg's (2010) studies on reflection in blogs or by research on contextual issues like socio-cultural factors affecting engagement in online collaboration through discussion-based technologies (Cakir, 2013; Brass & Mecoli, 2011).

Technologies have served as a path of teachers' professional development through their use in the classroom in both the global south and in developed countries. Regarding the former, a good example is Hennessy et al. (2016), a study on the interactive use of mobile technologies (e.g. tablets, netbooks, e-book readers) along with open digital educational resources and open source software in African schools for teachers' professional development. Here, the authors claim that building online professional development in contexts where technology is restricted requires programmes structured to exploit the technological tools available for teachers' learning and invite them to reflect on the technological impact of future technologies. For example, teachers noticing the future struggles of pupils with certain technologies, those technologies' interactive values, or

simply the impact of technology on their practice, can provide the professional foundations for their learning with technologies. In contrast, in developed countries –and drawing on my closest academic experience at the University of Bristol– this involves research where videos are used to explore facilitating factors in professional development discussions among teachers of mathematics in England (Coles, 2016). Here, teachers recorded their practices to later engage in collaborative dialogues with colleagues about the videos to explore discussion norms. In all, this suggests that researchers are interested in the collaborative domain and, more importantly, in how technologies can contribute to ways of thinking by embracing dialogue, the avoidance of isolation through the sharing of knowledge, and the formation of online communities for support and inquiry.

Technology has also boosted creativity both in teachers who decide to support colleagues in their professional development and in academic practitioners who seek to address the learning potential of technologies in their teaching. An interesting example of the former is Rodesiler's (2017) study involving a teacher (the author) creating an online professional development offering through blogs to explore teaching using young adult literature in the company of other teachers sharing the same concern. This study is creative because a teacher reciprocally satisfied his contextual needs by supporting his colleagues, thereby engaging both parties (the teacher and the study participants) in a free, bottom-up, and contextually relevant online professional development opportunity. An example of the latter is Lai and Ng's (2011) study involving two classes of information technology student teachers who created a wiki on Google sites by following a set of developmental stages that broadly covered the construction of a wiki, its assessment, and its practical implementation. This study is also creative because the authors approached technology as a tool for creation and knowledge generation, that is to say, the student teachers built on their own understanding of the uses of wikis by creating and working on a wiki. In short, collaboration and creativity are products of the uses of technology for online professional development.

Among the benefits of technology for professional development, the potential for *asynchronous* and *synchronous* communication may well be the most prominent due to their practicality, since they enable teachers to work at their own pace. Broadly speaking, the literature reviewed in this study suggests that the flexible time factor that technology grants enables teachers to engage in

online professional development whenever they can, including weekends or at any time they are available for interacting with others, while also allowing them to have extra time for reflection (Palloff & Pratt, 2007; Scott, 2010; Hall, 2018). Nonetheless, there are also challenges; for example, Srinivas's (2015) study exploring teachers' response to Web 2.0-based professional development noted that teachers working at different time zones with a lack of synchronous contact interfered with collaborative activity, and that this mismatch in communication led teachers to lose direction and reduced their motivation to contribute in tasks. Srinivas suggests that online professional development programmes (ideally) need to include a face-to-face component, even if it is through "Skype or webinars" (p.242). Attitudinal challenges can also emerge when integrating technologies in the professional development of teachers. Here, it is critical to consider the idea of change, regarded as the implementation of something new for teaching or learning. According to Craft (2000), change is a complex process which tends to be underestimated by those responsible for introducing it. For instance, Hennessy et al. (2016) describe how Zambian primary school teachers resisted moving away from lecturing monologues while teaching due to their ingrained beliefs about the role of theory in education leading them to struggle with new forms of collaborative work. Furthermore, teachers may perceive innovations as unnecessary because they were not used in the past (Köksal, 1995). Evidently, online professional development must deal with similar challenges as offline professional development in terms of attitudes to innovation. Here, the integration of technology over the years has confirmed insight from the wider research literature and suggested key components (e.g. reflective activities, social presence, collaborative work, support) that online professional development programmes should include to support teachers' learning.

2.4.2 Online learning models for online professional development

The search for effective online professional development experiences in education led to the emergence of several online professional development models over the years (Salmon, 2000; Garrison, Anderson, & Archer, 2000). Of those, an early model, perhaps the most extensively applied over 15 years ago in Chile and abroad, was Salmon's (2000) model of online learning. This model is interesting because it emerged from the author's studies on action research in online environments, hence supporting the idea that learning in online environments happens in activities

such as collaborative work, understanding of technology, support through facilitation, and reflection, although the model does not address reflection explicitly. Figure 2.2 shows this model.

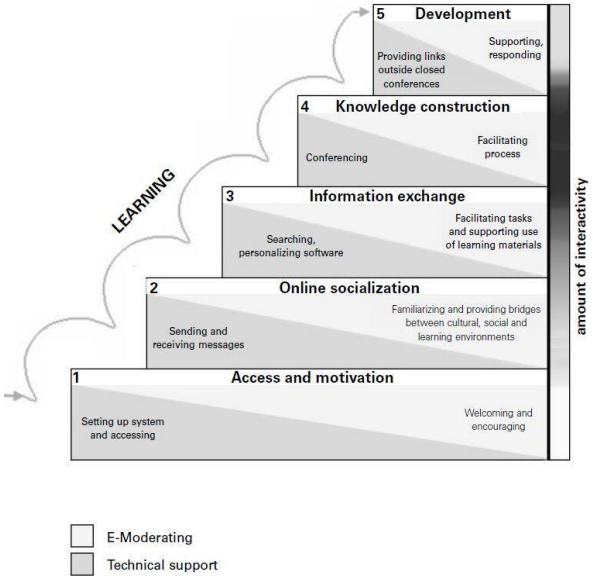


Figure 2. 2 Salmon´s Model of teaching and learning online (Salmon, 2000: 29)

Basically, this model divides the application of E-moderation skills and technical support into five stages, portraying learning as a progressive experience where the amount of interactivity (see bar along the right) increases as one moves through the stages; that is, this model presupposes that collaboration increases together with participation. In this model, each stage is divided into two dimensions: one outlining the participants' mastery of certain "technical skills" (shown on the bottom left of each step) and the "e-moderating skills" required for guiding learning (shown on the top right of each step) (p.29). This model has been criticized for portraying learning as a rigid process, not addressing reflection in detail, lacking face-to-face options, which limits the sources of interactivity available to the model, and for making technology use something compulsory for development *(*Chowcat, 2005; Jones & Peachey, 2005). All in all, this criticism evidences the importance of considering how technology use can contribute to teachers' professional development, without making it compulsory or too rigid for teachers who started their learning trajectories with technologies in contexts (such as Chile) where online professional development was only emerging over a decade ago.

This criticism led to the emergence of models based on socio-constructivist perspectives that approach the learning experience as a combination of individual inquiry, collaboration, and reflective intents (Morales, 2015; Elliott, 2017) through integrated dimensions with room for face-to-face encounters rather than a stage-approach to technology use for development, with Garrison, Anderson, and Archer's (2000) "Communities of inquiry" model providing a good example. The community of inquiry approach has been used in various educational settings including Chile (Morales, 2015), Malaysia (Kamarudin, 2015) and the USA (Lambert & Fisher, 2009) to foster students' and teachers' critical thinking and learning. Broadly, Garrison and colleagues see online learning as a product of the integration of cognitive, social, and teaching presence to foster learners' (such as teachers and students) critical thinking and learning through collaborative work. Figure 2.3 shows a visual representation of the communities of inquiry model.

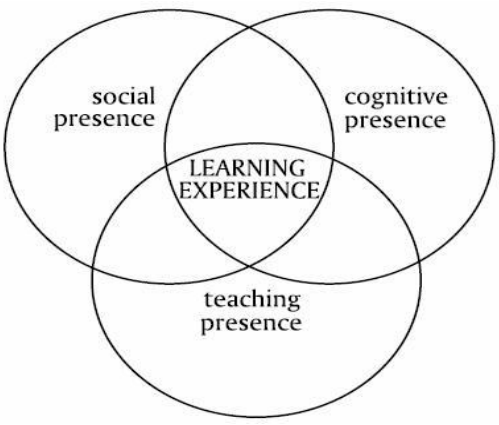


Figure 2. 3 The communities of inquiry model (Garrison et al, 2000: 88)

In this model, *social presence* has two facets. First, the idea of projecting an online presence, or "online personality" (Palloff & Pratt, 2007: 202), which informs personal features, professional interest, academic trajectories, or school contexts for building trust. Garrison's (2007: 3) indicates that social presence manifest itself in different shades, but mainly involves the personal ability to "project one's self and establish personal and purposeful relationships". Thus, conveying socio-emotional features such as likes, concerns, and motivations is essential for learning in online environments, especially if these features project similarities with others and intentions to interact (Palloff & Pratt, 2007). Various online professional development programmes address the building of trust in online teacher education programmes through similar strategies for promoting social presence. For instance, in The Consultants-E (2018) –an online teacher training organization–, a

facilitator individually welcomes the 5 to 8 participating teachers, giving encouragement and suggestions for them to start working while also providing technical support. This approach adopts a personalistic focus, based on my experience in one course, where the limited number of enrolled participants supports this social practice. For its part, the British Council Certificate in Secondary English Language Teaching (CiSELT, 2013), considers both the *my profile* area for each teacher to add information about their professional and personal life along with a *socializing* area for the participants and a facilitator to interact about aspects outside/about their professional roles. Based on my experience, I argue that CiSELT strategies are socially effective but tend to be less personal due to the enrollment of a larger number of participants. The second feature of social presence is centred on enhancing an awareness of the presence of others online and, more importantly, it is aimed at maintaining that presence over time to form a community (Pallof and Pratt, 2007; Lloyd, & Duncan-Howell, 2010). Several authors argue that, for that cohesion to happen, online meetings need to have an intellectual focus, manifested through the idea of having a shared goal towards problem-solving, learning, or building something together (Garrison, 2007; Wenger, 2009). This suggests that the quality of social interaction depends on the extent to which emotional, cognitive, and social intentions (over time) converge to generate collaboration (Crook, 2000; 2011).

Teaching presence refers to (a) design aspects of the online learning experience such as the structure of the course or the material used and (b) the delivery of the contents, including aspects of the facilitation of collaboration and reflection along with channels of guidance for community formation (Garrison et al., 2000). In the first domain, the adequate selection of resources, length of the experience, and the scope of the contents can lead to positive outcomes. Notions regarding sequentiality or goal-orientation –as reviewed in section 2.3.1.2 (p.46)– are considerations that course designers must acknowledge to generate effective online professional experiences. Regarding the role of the facilitator, in this case represented by a teacher, it is critical for learning through the creation of a strong teaching presence. Palloff and Pratt (2007) outline categories to define the facilitator's role and features in online environments. These authors, after reviewing the model advanced by Garrison et al. (2000) and the functions of online instructors described by Collins and Berge (1996), suggested that being a facilitator involves providing guidance on what to do, having a constructive attitude towards learning, and possessing managerial skills to organize resources and the learning site. A facilitator should guide participants through examples, develop

a sense of cohesiveness by setting goals, instigate participants to obtain resources, ease the flow of the course through strategic actions like linking ideas and adding summaries, and ensure participants' comfort by making technology as "transparent as possible", meaning uncomplicated to use (p.117). Finally, *cognitive presence* refers to the way students interact with the contents in the online experience to develop their learning with others and individually and reflect on the process itself (Garrison et al., 2000), that is to say, learning happens when the cognitive presence is supported by the teaching and social presence. This means that, for example, the level of cognitive presence of the teachers in this study will be impacted by my strategic manoeuvres as facilitator for prompting collaboration and reflective intents, my use of resources (e.g. training material, articles, summaries), and the relationships teachers build among themselves for their professional development in The Wiki Project.

This review of online learning models (Salmon, 2000; Garrison et al., 2000) has highlighted key features and dimensions for teachers' learning to occur online. These considerations broadly involve: (a) *social presence* for giving teachers the possibilities to project aspects of their personalities online, thus aligning professional and personal similarities and influencing motivation to interact; (b) *continuous support*, manifested through the idea of facilitation of professional development processes online and all the technical and practical considerations that this implies; and (c) *learning opportunities*, signifying the articulation of activities that create opportunities for reflection and collaboration, where collaborative practices become key aspects for promoting learning and development. In addition, I have reviewed critical voices that envisaged technology use for learning as a complement in balance with face-to-face components.

2.4.3 Wikis for teachers' professional development: Key international studies

A wiki is "a website that allows users to generate, mix, and edit content within a shared and openly accessible digital space" (Marstio & Kivelä, 2014: 76). This collaborative affordance supports the expression and interaction of ideas at a distance in either asynchronous or synchronous fashion (Biasutti & EL-Deghaidy, 2015). A wiki is also easily accessible by giving rights and access to users, who can erase, modify, or edit the content regardless of who put it there in the first place (Brox, 2017). Regarding the latter point, Google sites, through its free application Google Docs,

allows users to collaborate in a real-time, enabling them to copy and paste contents, use varied editing tools for adding pictures, and share hyperlinks with varied information, including news, videos, or documents, all for free (Google, 2018). Mansor (2012) suggests that the benefits of Google Docs for collaborative writing lie in how easy it is to work in the application because there is no need for computer configuration or account creation; nonetheless, potential limitations include problems caused by a slow Internet connection and the unavailability of advanced editing tools. For example, participants cannot add videos –only links of them– thus, visuals need to be edited (e.g. in size and position) to avoid affecting the reading of the comments. Direct interaction is available in a chat option or by adding embedded comments within contributions. The latter option is asynchronous, as exemplified in Excerpt 6.5. (p.185).

The premise that wiki-based technology can support teacher professional development has impacted wiki research since the mid-2000s. Early studies explored wikis and their community potential for learning to teach (Foley & Chang, 2006) and their possibilities in pre-service education for fostering collaborative knowledge building networks (Carr, 2008). This tendency to explore wikis in pre-service teacher education increased over the years by studying, for example, their use in creative writing and their impact over time on teachers (Brox, 2017); the adoption of collaborative capacities while creating, designing, and applying a wiki (Lai & Ng, 2011), or the improvement of teachers' assessment capabilities while evaluating digital learning material created in wikis (Ng, 2014). Wiki research has also explored the tool itself as a pedagogical aid for teachers, instructors, and students (Goldstein & Peled, 2016), assessed the level of collaborative work the wiki promotes (Hadjerrouit, 2014), and compared wikis with forums to evaluate their potential for collaborative writing in primary school teachers (Biasutti, 2017). Collaborative wiki-based research overlaps aspects of research on blogs, forums, and online discussions by exploring, for example, the influence of peer support and dialogue on teachers' development (Hall, 2018; Granberg, 2010) or how wikis operate as a didactic tool, embedded in Moodle, to apply project-based learning (Biasutti and EL-Deghaidy, 2015).

Research on wikis has also expanded our understanding of its mediating role in collaborative and reflective processes for in-service teachers, thus shedding light on the constraints and possibilities of wikis for collaborative activity. From these studies, Bustamante and Moeller's (2013) analysis

of 5 female German language teachers using the TPACK framework[3] through mixed technologies for technology literacy, language proficiency, cultural knowledge, and curricular acquisition seems pertinent to review in detail. In this study, teachers created technological projects and discussed their implementation in a wiki-like discussion board. A thematic analysis of interviews and discussion boards revealed that reflecting with peers on relevant pedagogical topics encouraged participants to take innovative risks in classes because other people's ideas were perceived as models to follow, which illustrates the impact of collaborating with someone who shares similar concerns, experiences, or histories regarding education. Nonetheless, teachers expressed concerns about the task instructions being too specific on what to do. This led to some teachers to say the same thing repeatedly in the discussion without writing anything new, making the post threads extensive and tedious to read. This is an interesting finding that evidenced how extended contributions in online wiki communication can affect motivations and intentions to engage in collaborative activity.

An insightful study about the dimensions that collaboration adopts in online environments in long-term and large professional development interventions was conducted by Chan (2011). From the analysis of policy documents and ICT reforms, the author concluded that, to change the traditional and individualistic models of teaching, Knowledge Building Teacher Network (KBTN) forums could support new professional development structures, enabling teachers to develop the capacity to implement collaborative knowledge building among their students (Chan, 2011), while also supporting their own professional development. The study included teachers of different subjects and from several schools who worked in a number of networks to coach newcomers, design knowledge building activities, and share their understanding with their colleagues. A mixed-method analysis was conducted, including statistical and qualitative analyses, through a principle-based approach (Chan, van Aalst, & Van, 2008). Findings revealed that it was quite challenging for teachers to work together online, as there were different viewpoints and teachers resisted new ideas. Furthermore, experienced teachers –who were supposed to share experiences and help new teachers to learn– resorted to telling their peers what to do in their classrooms by adopting advisory and prescriptive attitudes or presenting their views rather than providing scaffolding for

3 A framework inspired by Shulman's (1986) idea of the pedagogical, content knowledge required in teacher education which is complemented by the technological dimension for effectiveness in teaching.

newcomers to improve their understanding. This finding is particularly interesting because it suggests how collaboration in online environments primarily manifests itself through direct support instead of more interactive approaches for understanding and enhancing understanding with others. Furthermore, these findings also suggest that, even if there was additional time, pertinent interactive resources, and professional experience supporting collaborative work, certain constraints affecting collaborative activity in online environments would still be difficult to address, such as disposition or attitudes toward collaboration.

In the sphere of reflection, Hall's (2018) study of blogs is important because it addresses some singularities of reflection in a wiki-like online interface. This study involved twenty-six female classroom teachers in a two-year M.Ed. programme. These teachers were compelled to write a weekly blog entry and add contributions twice a week over a 15-week semester for credits. The researcher designed and taught the course and facilitated the blog discussion. Acting as a facilitator, she answered questions, provided feedback, and read all the posts; however, she avoided initiating discussions to keep students from waiting for her to launch new discussions. The author performed a conventional content analysis. Teachers used reflective opportunities to share and discuss problems of practice and seek help, without trying to better understand the situation or examine connections between classroom practice and course content. Nonetheless, after the facilitator introduced a reflective framework, the teachers began to question and challenge their instructional beliefs, hence perceiving things differently and adopting new attitudes due to their new beliefs. This shows how a reflective strategy enhanced reflective practice; moreover, it reveals how additional time grants possibilities for teachers to adopt critical views and for the researcher-facilitator to try new methods for eliciting reflections.

Brass and Mecoli's (2011) research acknowledges aspects preventing collaboration in a wikispace created by one teacher, for teachers, which went dormant one month after its creation. The sample comprised 15 to 20 professionally active teachers with 3-10 years of experience with strong academic backgrounds and progressive politics. Data included archived versions of the wiki, teachers' reflections and personal communications, course artifacts, and follow-up conversations with a subset of participants. The main finding was that teachers had different expectations of the wiki: while some wanted to collaborate, others wanted information. Additionally, the authors

suggested that teachers might have felt uncomfortable with the social practice embodied in the wiki, which was less dynamic and did not fit their conceptions of what to say or do as teachers. As such, the wiki restricted possibilities to be more dialogical, collaborative, participatory, and emancipatory regarding the expression of ideas.

Finally, Prestridge and Tondeur's (2016) study explored the elements that support teachers' engagement in online professional development experience. This study is pertinent to review as it involves action research for professional development and collaborative work through wiki-based technologies. Findings suggest that the online component complemented teachers' actual practices and that the practicality of working online catered to teachers' professional needs and interests; for example, some teachers addressed aspects of the curriculum or more personal interests such as robotics. The authors suggest that online professional development needs to be centred on needs, "but teachers need to create their needs" to generate relevant links with other professional development opportunities (p.208). The authors also suggest that constructive dialogue can only occur in online discussions when there is a mix of aspects including collegial relationships (e.g. trust and confidence to address other ideas), critical discussion (e.g. including critical reflection); and an effective mentor role to support what they call "constructive dialogue" (p. 201); most of all, they suggest that the existence of constructive dialogue motivates participation in the online environment.

Overall, this review sheds light on how some professional development programmes around the world have used (and are using) wikis to promote collaborative and reflective practice at pre-service and in-service levels. It also evidences the approaches adopted to examine wiki activity, which predominantly involve thematic and content analysis (Bustamante & Moeller, 2013; Biasutti & EL-Deghaidy, 2015; Hall, 2018) complemented by participants' views on the uses of wikis, captured through interviews and reflective accounts. For me, interviews seem pertinent to capture aspects of the ecology of collaboration (Crook, 2000), informing on people's emotional dispositions toward technology itself. However, interview-based perspectives might not necessarily provide insights into collaborative practice *per se*, mainly generating speculation on participants' perceptions. This study aims to address this gap by exploring the practice of collaboration (e.g. for building trust, negotiation, and division of labour) as it happened in a wiki

without focusing on teachers' perceptions on what is regarded as collaborative. Surprisingly, I noted that teachers' professional development on Google Docs as main platform, not complemented with Google Sites, Moodle, or other wiki-based systems was also limited to Lai and Ng's (2011) study. This suggests two methodological gaps in research conducted in Chile and abroad that this study aims to bridge: the implementation of interaction analysis in a wiki and the use of Google Docs (only) for mediating collaborative practice.

2.4.4 Online professional development in Chile and its collaborative roots

Since the early 1990s, ENLACES has greatly influenced the online educational research tradition by introducing ICT in Chilean schools, thereby enabling teachers to connect with their colleagues remotely and giving researchers the chance to explore the implications of these interactions. In this regard, Hinostroza, Labbé, & Claro (2005) analysed data from a national survey of ICT infrastructure and its formal and informal uses in schools eight years after the implementation of ENLACES in Chilean schools. Statistical analysis evidenced that teachers had three aims in mind when using technology: *instruction* (e.g. preparing lessons, teaching), *communication* (e.g. chatting with colleagues), or *leisure* (e.g. planning activities or chatting with friends). Interestingly, in the communicative and technical (hobby) domain, the report showed Chilean teachers' tendency to participate in online collaborative projects and interest groups for professional development, thus showing their technology-based collaborative practices over a decade ago. Years later, Hinostroza, Labbé, and Matamala (2013) presented the results of a national survey of 891 Chilean preschool teachers which explored their uses and perceptions of technology. Statistical analysis showed that preschool teachers were more confident searching for information to prepare teaching material (60%) and sharing ideas, stories, and experiences with colleagues on forums (58%), which indicates that their online collaborative practices focused on sharing and transmitting information for their development.

Another insightful national scale study exploring teachers' uses of ICT inside and outside the classroom was administered by Ibieta, Hinostroza, Labbé, and Claro (2017). This study used a nationwide sample of 6932 teachers in Chile to characterise their activities and perceptions associated with ICT. The authors employed multiple regression analysis to determine participants'

perceptual relationships with the ICT. Findings showed that teachers use ICT more frequently outside the classroom to prepare lessons, find ready-made material for teaching, and complement instructional strategies. Interestingly, the study showed that less experienced teachers use communication tools with colleagues and students more often. Here, teachers' practical uses of ICTs consisted in "communication with the educational community" (p. 431), including teacher–student pedagogical interaction outside the classroom and teachers collaborating with experts and school leaders for online pedagogical support through email, chats, forums, or other tools.

Currently, studies involving online professional development have emerged in conjunction with social media and E-Learning. In this regard, it is worth mentioning Morales' (2015) doctoral research: a case study about ELT teachers' technology use for teaching and professional development of their computer assisted language learning (CALL) competence. This study confirmed the importance of collaborative and individual reflection for developing CALL skills and knowledge in CALL teacher education, while also stressing the criticality of the online tutor in the achievement of teaching presence in online settings. To further explore this topic, I conducted a thesis repository web search, including both undergraduate and postgraduate research on collaborative activity in four traditional universities in Chile[4] along with the research activity performed at those institutions. The web search considered the keywords *colaboración, profesor,* and *tecnología* (collaboration, teacher, technology) within an eight-year period to frame and guide my inquiry towards current trends in post-graduate research on online professional development in Chilean universities. Currently, M.Ed. research on wiki-based approaches (e.g. wikis, blogs, forums) is sporadic, generally exploring the development of English language skills (Parada, 2011) or strategies for scientific learning in primary school students through blogs (Plascencia, 2015). Interestingly, university research activity included two online professional development projects with teachers from Universidad Catolica de Chile: one on the assessment of teaching pedagogies in learning environments and another on learning and teaching enhancement through online enquiry (Investigación UC, 2018). USACH, UdeC, and UC do not report any related studies currently.

4 Universidad de Chile (UC), Universidad de Santiago (USACH), Universidad de Concepción (UdeC), and Universidad Catolica de Chile (UCC).

In section 1.5 (p.22), I referred to MINEDUC's *Champion Teachers* action research project and its importance for the professionalization of ELT teachers in Chile. Here, the online professional development component is embedded in a British Council Moodle platform available for teachers to contact their individual mentors and colleagues for advice, sharing experiences, and accessing research material for their projects. The use of emails and Skype allowed teachers and mentors to communicate more personally and directly (Rebolledo et al., 2016). Based on the first-year experience, Smith, Connelly, and Rebolledo (2014) reported difficulties regarding technology use. For instance, the Moodle platform did not prove successful for the project because many teachers did not access it or used it only sporadically. Smith et al. (2014) cited the lack of communication between teachers and mentors in the workshop as a reason for this. Additionally, most mentors and teachers found the platform difficult to "access, navigate and use" (p.119); in this context, a successful Facebook group emerged. Email use was also problematic, as teachers did not reply to emails and one of the mentors did not email teachers at all, suggesting teachers' attitudinal issues towards replying emails and mismatches in expectations regarding the mentor's role in the process. On the positive side, teachers favoured Skype as a means of communication. This led to effective mentor-teacher communication, which made it possible to chart and guide the progress of projects or share professional experiences. Some mentors even started Skyping and having phone conversations once per month. Smith and colleagues' (2014) experiences with technologies in Champion Teachers highlighted Chilean teachers' need for more direct and human-like means of communication when starting collaborative action research projects. Here, guided and face-to-face contact through Skype supported their projects better, evidencing the importance of being flexible and having a range of collaborative channels.

In summary, MINEDUC –through ENLACES– has been the main precursor of research and professional development opportunities through its programmes and policies, which have enabled researchers to access the complexities of technologically mediated classrooms and supported visions of classrooms as intersections and learners in movement (Erstad, 2014). More importantly, MINEDUC has helped to define Chilean teachers' online collaborative uses and attitudes, therefore suggesting the need for more research on online collaboration for professional development, of which this study is an example. Research on Chilean teachers' use of computers for their professional development has emerged from nationwide reports (Hinostroza et al., 2005;

Hinostroza et al., 2013; Ibieta et al., 2017) and other recent studies (Morales, 2015). However, few studies have acknowledged collaborative practice and the social and constructive dimensions it involves (e.g. building trust, negotiation, and division of labour). This is much needed in a Chilean context to identify teachers' online collaboration tendencies, many years after the implementation of ENLACES, and to highlight some challenges and possibilities associated with their technology use. My study addresses this lack of attention with a focus on how primary and secondary school teachers use wikis to collaborate.

Wiki-based research is growing in Chile, with a handful of young researchers exploring its interactive potential for students' communication and learning (Parada, 2011; Plascencia, 2015). In this regard, I noted that the growing interest of postgraduate researchers, university research activity, and the work of precursors such as the Champion Teachers program precursors represent an auspicious starting point for efforts aimed at closing the professional development research gap, specifically in the field of collaborative practice and its manifestations through wiki-based technologies in Chile.

Summary

In this chapter, I reviewed the main aspects of the professional development process, including its main aspects: reflection and collaboration, the role of different actors (e.g. peers, facilitator), and how historical evolution has affected teachers' relationships with their learning, resulting in an array of possibilities that technologies offer for distance learning. Regarding the processes, I accounted for the conceptual differences regarding reflection and reflexivity, levels of reflection, and how some reflective models have been applied in teacher education to support teaching practice. I then focused on collaboration and the twofold dimension it adopts: the collegial aspect, regarded as more affective for building relationships through trust, support, confidence, and respect, and collaboration *per se*, involving teachers' actual engagement in collaborative practices. Both dimensions –collaboration and collegiality– mutually constitute and reflect one another (Kelchtermans, 2006), making it difficult to approach them separately. More importantly, I highlighted the binary collaboration-reflection relationship through a study (Kostiainen et al., 2018) that shows the connections between both processes.

I also addressed two mediators of professional development: people and technology and their essential role in mobilizing teachers' learning. Here, I expanded on action research and professional development activities as pertinent frameworks for supporting collaborative, reflective, and professional practices. I broadly referred to emails and video conferencing and how they can support remote connectivity with others, although my focus was on wiki-based technologies and the collaborative, reflective, creative, and connective dimensions they support. In this regard, I presented views suggesting that technology needs to be approached integrally in professional development programmes, and not as an additional input or compulsory aspect (Hennessy & Warwick, 2010; Hennessy et al., 2016). In addition, I reviewed the learning opportunities that technology affords, drawing on the online learning models advanced by Salmon (2000) and Garrison et al. (2000) as frameworks to review the social, cognitive, and administrative aspects involved in the orchestration of online learning. Finally, I succinctly review the connections between technology and collaboration in a Chilean context by presenting the main research carried out on teachers' technology use for professional development. There, I pointed out the importance of those studies for shedding light on the collaborative practices of sharing, support, and transmission of information; moreover, I noted that more studies are needed that consider not only broad professional practices, but also the actual collaborative practices that take place in discussion boards such as wikis. This is relevant if one wishes to explore how a group of teachers in Chile currently approach online collaboration and the challenges and possibilities they face. My study addresses these issues directly (see research questions section 1.6 p.27) and theorizes on how to understand collaboration practically through three key dimensions leading to constructive intents (see section 3.3.1 p.79). In the next chapter, I present the key ideas underpinning teachers' learning and collaboration to provide a theoretical framework for my study.

Chapter 3: Theoretical Framework

Teachers' learning and collaboration

Introduction

Socio-cultural theory (Vygotsky, 1978) has helped to theorize about teachers' learning in this study by situating the importance of social interaction, the influence of the context, and the mediational means in the social construction of learning. Socio-cultural approaches to teaching and learning were introduced and applied by Vygotsky and his collaborators in Russia in the 1920s and 1930s, emphasizing the interdependence of social and individual processes in the co-construction of knowledge (John-Steiner & Mahn, 1996). Broadly speaking, socio-cultural theory covers areas regarding human development and its origins in social interaction and the role of tools and signs as mediators of human learning and development (Wertsch, 1991).

In this chapter, I cover the developmental, contextual, interactive, and mediated foundations of teachers' learning in relation to three pillars of socio-cultural theory relevant to my study: socio-cultural context, social interaction, and mediation (Vygotsky, 1978; Wertsch, 1991; Kozulin, 1998; Lantolf, 2001). Moreover, I address some limitations of socio-cultural theory along with its benefits that suggested possible units of analysis in this study. In this chapter, I also theorize about the concept of practice and participation (Wenger, 1998; Dreier, 1999). Firstly, I define professional development in this study and theorize about the importance of participation in my analysis of teachers' learning under socio-cultural perspectives. I finally define collaboration and theoretically describe it as a practice. This is important before defining aspects of collaboration in technological domains. I conclude by briefly discussing reflection and reflective practice to theorize about its meaning in this study and its links with collaboration. As I have mentioned in sections 2.1 (p.31) and 2.2.2 (p.38), these processes cannot be separated in understanding professional development. This chapter concludes with a brief explanation of my theoretical framework and its visual representation.

3.1 Socio-cultural theory

Socio-cultural theory suggests that learning (such as teachers' learning) is a developmental process that takes place in a socio, historical, and cultural context (Vygotsky, 1978). This means that

learning is not merely the acquisition of knowledge dictated by biological maturation as a child grows (Kozulin, 2002), but rather an unfolding process of acquisition of tools, assisted communication, cultural acquisition, and social interaction for intellectual development (Ivic, 2000). In this regard for Vygotsky,

> *"Human learning presupposes a specific social nature and a process by which children grow into the intellectual life of those around them" (Vygotsky, 1978: 88)*

This claim helps to make inferences about development and its connections with learning, the temporal and interactive conditions required for learning to occur, along with situating learning as a socially, historically, and culturally determined process (Ivic, 2000). In the first regard, Vygotsky's idea places human learning as a precondition for growth or development. That is to say, for development to happen, a person primarily needs to engage in learning processes by internalizing ideas, concepts, and the culturally generated tools available for communication. As such, development happens twice: first on a social plane and then internally (Vygotsky, 1978). Here, the use of mediational means (Wertsch, 1991;1998), such as language, signs, and symbols supports that purpose (Lantolf, 2000). According to Vygotsky (1986), in children's pre-verbal stages, development is achieved through activities with adults in asymmetrical interactions involving signs and semiotic systems as mediators for learning, although social interaction through the use of language is the key for development in adults.

As for the social aspect of development, Zittoun and Gillespie (2015) argue that the concept of internalization, introduced through the 1978 publication of Vygotsky's work *Mind in Society*, refers to the acquisition of "operations, social interactions and culture" as part of the development of higher mental processes (p.2), and where the internalization process presupposes a transformation because internalization designates the core process through which culture becomes mind. This idea suggests that the transformation of social behaviour, for example, from interaction to understanding, collaboration or reflective practice presupposes a process requiring the engagement of two people or more in a practical activity, indicating that development takes time to occur, as already mentioned in section 2.1 (p.31); more importantly though, this view suggests that learning is co-constructed with others through interactions (Linell, 1998), in a collaborative process of negotiation (Roschelle & Teasley, 1995; Stahl, 2003), involving reflection as expanded later in sections 3.3.4 (p.82) and 3.4 (p.84) respectively.

Finally, Vygotsky (1978) regarded human mental development as historically situated and culturally determined, because human beings are born within a society that utilizes specific tools and signs for communication with others (John-Steiner & Mahn, 1996). Thus, learning occurs through the internalization of social interactions in a socio-cultural context, where language is a powerful tool to form functions, generate meaning, or represent thought (Ivic, 2000). With this idea in mind, learning is seen as co-constructed and affected by the prior socio-cultural and historical experiences people bring with them to the learning process.

I have argued that socio-cultural theory advances a view of learning as a developmental process which is (a) culturally determined by the society where one lives; (b) socially constructed through interaction; and (c) mediated by tools and signs (Wertsch, 1991). I expand discussions in these three areas to conclude with the main benefits and challenges the socio-cultural perspective has brought to my study.

3.1.1 Socio-cultural context

The idea of context has been interpreted from different theoretical perspectives: context as the mental surroundings people create (e.g. for the modelling of learning and scaffolding), context as a situation and the person's involvement in the situation for individual meaning, and context as an activity that integrates human action as a coherent whole (Van Oers, 1998). Despite these differences in interpretation, the impetus of particularization of meaning that "brings about coherence with a larger whole" (or surroundings) is shared by all theoretical definitions (ibid:475). Cole (1996: 132) argues that context viewed as a situation involves "levels of context", that is to say, a middle unit referred to as *task* or *activity* in which people engage, for example, a teacher teaching verb conjugations, and the understanding of how this task is shaped by broader levels of context: the lesson in a school classroom context. Therefore, context is always interconnected and supports the creation of meaning in relation to the situation as interpreted by the person involved. From this perspective, context is an actively relational process involving the person and their surroundings (Cole, 1996). For me, this idea targets several factors affecting the notion of context in the specific, non-linear, and complex temporality where contexts occur. Consider, for example,

the context of a professional development programme for Chilean teachers (see section 1.5, p.22), recurrently affected by the new regulations suggested by governments as well as by society and world trends in education, all of which suggests that regarding context as a situation makes it possible to examine the relations and influence of social factors in rather a "complex interdependence among levels of context" (ibid:134).

The perspective of context as activity involves Vygotskian considerations that regard the social construction of context as a non-dualistic interplay between subject and object (Lund, 2003; Cole, 1996): a communality; that is to say, context is embedded in cultural activities that people engage in (Van Oers, 1998). In this regard, Cole (2006: 135) refers to context as "That Which Weaves Together" to signify that, when performing activities, people engage in coordinated processes that acquire a particular meaning and significance depending on the coherence of the coordinated processes. Therefore, the value of the activity will generate context depending on the coherence created in the activity system (Van Oers, 1998). For example, the action research approach may articulate a meaningful professional development context if the coherence created by the teachers, people involved, and their uses of cultural tools comprise a connected whole that gives coherence to the different aspects of the experience (Van Oers,1998; Cole, 1996). Specifically, the dynamics of an activity reside in the complex interrelationships of motive, goals, means, actions, and operations people negotiate in an activity, hence people's levels of participation in activities recurrently affect the creation of context. In short, in this perspective, context is understood in terms of socio-cultural setting, involving tool-mediated actions, interactions, motives, operations, and goals that are to be valued in the framework of activity (Van Oers ,1998).

Summarizing, I presented two interpretations of context relevant for my study, both of which address the idea of the embeddedness of meaning in some kind of surrounding (Van Oers ,1998). One suggests that social situations influence the creation of context in relational levels, while the other addresses the constructed nature of context in activity, where context is constantly affected and created by the cultural and social practices people participate in and create, socio-political and historical conditions, interactions with others, and use of tools.

3.1.2 Social interaction

Learning is a social activity (Vygotsky, 1978) that involves the understanding of mental functioning in relation to mind and behaviour as a single system (Ivic, 2000). As such, social interaction plays a fundamental role in the articulation of learning because learning manifests itself first in relation to others in an "intermental plane" through social interaction, and then in an "intramental plane" which involves the individual, personal, and mental process required to make sense of the interpretations presented by others (Daniels, Cole, & Wertsch, 2007: 13). Thus, Vygotsky (1978) stated that;

> *"Every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level; first, between people (interpsychological) and then inside the child (intrapsychological). This applies equally to voluntary attention, to logical memory, and to the formation of concepts. All the higher functions originate as actual relationships between individuals."* (p.57)

This idea introduces two important considerations for this study regarding the participation of people (such as teachers) in social activities for learning purposes. First, it suggests that other people (e.g. a facilitator or teachers) can implicitly and explicitly mediate mental functioning when interacting with others in activities (Wertsch, 2007). For example, people can introduce questions, share ideas, or material into an activity, hence mediating the cognitive development of others. This idea has been frequently adapted in education to understand the role of others as a source of support for learning in interaction, through Vygotsky's conceptualization of the Zone of Proximal Development (ZPD):

> *"the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under the guidance or in collaboration from a more capable peer" (p.86*).

This socio-cultural view is relevant according to authors who stress the importance of the location where learning takes place and the heterogeneous grouping of collaborators in joint activities (Lai, 2011). By considering the socio-cultural perspective that learning happens in the Zone of Proximal Development (Daniels, 2001), it is possible to theorize that a heterogeneous group of teachers with different professional experiences, knowledge, and ways of thinking can support the development of others by stating alternative perspectives, making suggestions, giving advice, or using other

mechanisms to support understanding inside the ZPD, i.e. the social plane created through interactions.

The second consideration supports the idea that activity provides the social context for the mutual construction of understanding through interaction (Engeström, 1999). This activity accounts for the relationships of three aspects, including (a) the subject, or the doer of the activity (e.g. teachers), (b) the artifacts or the socio-cultural mediational mechanisms involved in activity (e.g. a wiki, material resources, symbols, signs), and (c) the objective or goal of performing the activity such as problem-solving or learning (Engeström, 1987). Thus, the cyclical relationships of these three aspects shed light on how an individual person articulates perspectives of learning in a problem-solving activity, thereby providing the grounds to theorize on the importance of mediational means in bridging the person (the subject) with her/his objective or goal.

Social interaction within activities leading to learning and collaboration is not only a cognitive matter: it also has an embedded emotional side (Crook, 2000), which is represented by Vygotsky's (1978) idea of *perezhivanie,* the way a person becomes aware of, interprets, and emotionally relates to a certain communicative event (Clarà, 2016). In this regard, Crook's (2000) work on collaboration and its impact on learning reveals the need to understand the social process of collaboration from social, cognitive, and emotional perspectives to have an ecological vision of the social process itself. I argue that Crook's view captures a socio-cultural way of understanding learning as a process with an affective quality that defines a certain emotional context, along with possibilities and limitations for social interaction, as expanded in section 3.3.2 (p.79) In summary, social interaction is at the core of human learning because it delimits the mediated and situated nature of learning for development to happen. Social interaction happens in a social context created by the activity and the relations of its components, with this activity opening spaces for learning in the social, cognitive, and emotional domains.

3.1.3 Mediation

A fundamental assumption of socio-cultural theory is that learning is a mediated process (Vygotsky, 1978) which involves "the use of cultural artefacts, tools and symbols, including language" (Moll,

2000, cited in Thompson, 2013: 249) that are socio-cultural in nature, therefore, they cannot be separated from their context (Lantolf, 2000) and are a fundamental component in understanding learning processes (Wertsch, 2007). Thus, the basic idea of mediation is that the cognitive development of humans and their relationships in the world are not a two-sided, subject-object bidirectional process (Cole, 1996); rather, they are mediated by physical and symbolic means, including oral and written language.

Interpretations of mediation in the literature have served to clarify its types and its relationships with human learning activity (Kozulin, 1998; Lantolf, 2001; Wertsch, 2007), while also presenting perspectives to theorize about teachers' learning in online settings for this study. To start, Kozulin (1998) explicitly highlights the role of other human beings compared to the other two aspects of mediation: material tools and psychological tools. Regarding the first element, Kozulin suggests that human mediation emerges through Vygotsky's idea of ZPD, thus highlighting a direct relationship with others in interaction, as opposed to more collective, interpersonal, and symbolic representations such as material and psychological tools (Guerrero Nieto, 2007).

Lantolf and Thorne (2006) also make an interesting point about mediation by claiming that the mind is mediated, therefore, the individual is not in a direct relationship with the world, but in a mediated relationship through the use of physical tools and symbolic tools:

> *"while physical tools are outwardly directed, symbolic tools are inwardly or cognitively directed. Just as physical tools serve as auxiliary means to enhance the ability to control and change the physical world, symbolic tools serve as an auxiliary means to control and reorganize our biologically endowed psychological processes" (p.201)*

These authors envisaged two dimensions of mediation –one physical and one symbolic– which jointly trigger higher forms of mental functioning. These tools can be classified under the umbrella term of artefacts, because they are created by humans under specific social, cultural, and historical conditions; therefore, they carry with them the characteristics of a culture (Lantolf, 2001). The importance of these claims for this study is that mediation is socio-cultural in nature, suggesting that learning (such as teachers' learning) is not a solitary exploration of the specific environment where learning takes place (e.g. learning in a wiki); rather, it is a process of acquisition of the

methods, actions, and functions that already exist in a given culture for the construction of knowledge (Ivic, 2000).

Similarly, Wertsch (2007) also distinguished between two kinds of mediation based on Vygotsky's work (1981). According to him, mediation can be implicit and explicit. Explicit mediation refers to the overt or intentional introduction of a stimulus into an on-going stream of activity, where the materiality of the stimulus or sign involved "tends to be obvious and nontransitory" (p.180). In contrast, implicit mediation tends to be less obvious and therefore more difficult to detect (e.g. inner speech). These ideas support an understanding of how other people (e.g. a facilitator or other teachers) can intentionally or unintentionally introduce mediational elements to convey meaning clearly or support other understandings (e.g. pictures, videos), while also showing how technologies can explicitly be introduced as tools to mediate teachers' learning (Lantolf, 2004), as in the case of this study.

3.1.4 Possibilities and challenges of socio-cultural perspectives

So far, socio-cultural theory has supported an understanding of teachers' learning as a developmental, contextual, mediated, and interactive process in a socio-cultural context (Vygotsky, 1978). It is developmental and contextual because it involves processes of appropriation of tools, contextual influence and creation, and internalization of concepts and ideas in a procedural manner for the achievement of cognitive development in a socio-cultural and historical context that in turn affects the learning experience. It is mediated because people use cultural artefacts, tools, and symbols, including language, to bridge actions with objectives and then reach a learning goal within activities. It is also interactive as learning starts through interactions with others in an intermental plane first through social interaction. As such, socio-cultural theory embraces understanding teachers' learning as a developmental and interactional achievement situated in a social context mediated by tools, such as technologies and other people. Based on this idea, I argue that the main possibility socio-cultural theory has brought to my study is the identification of the basic units of analysis for studying teachers' professional development and collaboration comprehensively, namely *trajectory* and *interaction*. In the first regard, trajectory as unit of analysis (see section 4.3.2.1, p.117) accounts for the socio-cultural processes affecting teachers'

learning over time in a specific context. This highlights a signifying perspective of the social process of professional development by acknowledging, for example, the impact of specific contextual situations, the use and professional impact of specific mediational means (e.g. email, wikis) over time, the emergence or recurrence of professional practices while working with others, or a more global perspective of my role and that of others in the learning experience. From an interactive perspective (see section 4.3.3.1, p.126), focussing on social interaction promotes the exploration of the interactive core from where learning emerged, thus drawing clear links between learning and affection in interaction, identifying different approaches to interaction, creating substantive links with collaborative activity, and also identifying the impact of mediational means (including people) while interacting for professional development.

Debate has emerged regarding socio-cultural theory over the years, for example, Fjuk and Ludvigsen (2001) critiqued how the study of technology had been approached from the socio-cultural perspective, stating that the analysis mainly addressed small-scale interactions and not real interactive and communicative situations which they argue promote a more adequate understanding of the technology-mediated learning process. In the same vein, a pertinent critique is presented by Rasmussen (2005), who expressed concerns regarding how well this approach could capture the social process of students' project work and how faithfully it could represent social processes when presenting research results. In this case, she challenged the validity of the representation of the uses of technology in processes of mediation as a means of support among students and teachers. Here, the complexity of analysing social situations seemed to pose challenges for socio-cultural representations of evidence. I faced complications when representing the social experience of teachers' work in this study, which I addressed as described in section 4.4 (p.132).

3.2 Practice and participation

The concept of practice has been addressed in the literature in reference to the idea of a person in action or doing (Wenger, 1998; Dreier, 1999), either in professional activities or in everyday life (Schön,1987). In essence, practice constitutes a special kind of doing, which is situated in a "historical and social context that gives structure and meaning to what we do" (Wenger, 1998: 47),

positioning practice as always social and connected with everyday activity in real life settings (Dreier, 1999). Practice includes implicit and explicit dimensions: the implicit realm refers to relations with rules, intuitions, perceptions, or worldviews regarding practice, while explicit dimensions refer to the use of specific jargon and tools, defined roles, or procedures for various purposes regarding practice as well (Wenger, 1998). As such, the idea of practice highlights the negotiated nature of the explicit and tacit actions that people perform to achieve a working experience; as clearly put by Wenger (1998:51), practice is about "negotiation of meaning" in an experience of everyday life.

People's involvement in practice (e.g. in the social practice of professional development) introduces an important consideration for this study: that the person should engage in relationships with others and think beyond him/herself to understand thoughts, actions, emotions, and orientations in a whole-person process during a trajectory of participation (Dreier, 1999; Wenger, 1998). The idea of participation has been extensively addressed in theories of learning that consider (social) practice as the source of meaning, learning, or identity. For instance, Wenger's communities of practice theory (1998) suggests that engagement in practice for meaningful learning does not just involve getting something done by an individual or group, but rather involves "participation" in a process of taking part of the social situation and the relations with others in an activity or enterprise, and that while engaging in that experience of mutuality, participation becomes a source of identity, that is to say, an "identity constituted through relationships of participation" (p.56). Dreier (1999) also addresses the idea of participation in his theory of participation in structures of social practice. For him, participation defines the subjects (the people) as always in social practice, situating the people in a local context like a community, culture, society and never, therefore, as "free-floating agents" (p.6). In addition, Dreier argues that by considering participation in social practice as the basis to understand personality, identify, and self, it is possible to address individual action and psychological processes as partial phenomena in relation to social practice. Rasmussen (2005: 69), in researching project work and ICT, applied the notion of trajectory of participation as unit of analysis to understand learning as a "multilevel phenomenon", thereby exploring the various interactions in different settings, the multiple participation structures, and what characterises social interaction over time. She argues this approach promotes going beyond a particular situation to understand how knowledge and

interaction are constructed in social interaction; thus, she regards human action, activity, relationships, interactions, and context as multiple involvements in social practice (Dreier, 1999).

In this section, I have presented theoretical perspectives of (social) practice as an abstraction defining what people do either in professional activities or in everyday life. Practice constitutes a social, historical, and cultural construction that gives meaning to what we do, therefore, practice always involves a negotiation of meaning in everyday life (Wenger, 1998). I also presented perspectives about participation in social practice and how the idea of participation has been approached to explore learning, meaning, and identity (Wenger, 1998; Dreier, 1999; Rasmussen, 2005). Mainly, I explored the possibilities that this perspective brings for understanding social activity and the multiple dimensions of learning. In the next sections, I first discuss how collaboration can be understood in this study and then discuss how the practice of collaboration can be understood theoretically. I also refer to reflection and reflective practice as a means of demonstrating their links with collaboration. I conclude this chapter by defining my theoretical framework based on the ideas presented.

3.3 A Definition of collaboration

A definition of collaboration is important because it unifies conceptual differences in the literature –which regards collaboration as either a state or process– and specifies my socio-cultural epistemologies, linking collaboration and teachers' learning in an online setting. For this working definition, I drew on traditional approaches to collaboration that inform children's social and cognitive development, along with approaches directed to adults in collaborative activities. Having both views is pertinent because these approaches focus on the socio-cultural "nature" of the collaborative process itself, hence comprising a comprehensive framework to theorise about collaboration.

Vygotsky (1986: 48) regards collaboration as the "collision of our thought with the thought of others that engenders doubt and calls for verification". This emphasis on ensuring verification reflects an interactive situation where people (e.g. teachers) share thoughts with others, explain ideas, and communicate ideas successfully. As such, collaboration always involves others in a

communicative activity, thereby suggesting people interacting, entering into relationships, and choosing what to communicate in relation to the other (Schwartz, 1999).

Collaboration takes place in a socio-cultural environment which can improve or limit development depending on the nature of the social interaction with others (Kozulin, 2003); thus, willingness to collaborate is critical because it recursively affects others' attitudes to sharing ideas, open thinking, sharing material, and so on, which suggests there is an affective side that informs motivations, attitudes, and feelings toward collaboration (Crook, 2000). In this regard, an important aspect of collaboration is that it seems to be more effective when it happens naturally, without contrived regulations and impositions (Hargreaves, 1996). Here, many collaborative arrangements can be orchestrated for collaboration to happen more naturally, involving elements such as face-to-face and online conversations, interaction through email, or group work in wikis. In this regard, when collaboration is voluntary, aspects like trust, respect, and support –frequently referred to as collegiality (see section 2.2.1, p.36)– emerge as a fundamental basis for collaborative activity to occur (Kelchtermans, 2006; Barfield, 2016).

Collaborations are social events (Crook, 2000), mediated by another human being in organized social activities including psychological mediators such as signs, symbols, and texts (Kozulin, 2003). Two aspects of mediation were addressed in section 3.1.3 (p.71): the role of human interactions as mediators of learning (Rogoff 1995; Kozulin 1998) and symbolic tools as stimuli for learning (Feuerstein, 1980; Kozulin, 2003). So, one aspect of collaboration will involve people (such as teachers) sharing understandings, similar interpretations, explanations, or answers regarding human and symbolic mediational tools (Dooly, 2008), implying that collaboration is always a mediated process.

The idea of learning as a social and developmental process in socio-cultural theory (Vygotsky, 1978) has supported an understanding of collaboration as a process of construction through the social interaction with others (Littleton & Häkkinen, 1999). In this regard, Dillenbourg defines collaboration in relation to learning, as a

> *"situation in which two or more people learn or attempt to learn something together" (1999:1)*

In this definition, the constructive idea resides in working with others in a process aimed at achieving learning, hence suggesting that people decide on goals together, share responsibilities, and make individual and communal efforts to achieve far more than by individual efforts (Barfield, 2016). Roschelle and Teasley also provide interesting insight to understand collaboration by saying that

> *"collaboration is a coordinated, synchronous activity that is the result of a continued attempt to construct a shared conception of a problem" (1995:70*)

In this definition, the "continued attempt" idea suggests that collaboration is a state (Brna, 1998). Simply put, in the constructive process of collaboration (e.g. for solving problems in a wiki), teachers may coordinate efforts recurrently (e.g. for building trust and negotiate ideas), and while doing this they maintain a collaborative state over time. Here, the issue of synchronicity and asynchronicity becomes central because communication in online environments (such as a wiki) is characterized by the sense of asynchronicity. For instance, teachers communicating ideas in a wiki are an example of asynchronicity in a technical sense because they will contribute at a time of their choice. Nonetheless, in the communicative domain, teachers might have created a subjective feeling of "synchronicity of reasoning" (Dillenbourg, 1999:9) by responding to others at a different time but with a frame of mind inspired by the mutual exchange of information.

In summary, collaboration involves a communicative situation that takes place in a socio-cultural environment, constructed through the mediational framework of the language, tools, people involved, and the activity, not inside people's head, in a vacuum (Roschelle & Teasley, 1995). Additionally, collaboration entails a process of construction (Littleton & Häkkinen, 1999), so people engage in relationships by creating connections, choosing what to communicate, and sharing understandings while coordinating efforts in synchronous and asynchronous ways toward a shared goal; in doing so, people engage in a collaborative process and state (Brna, 1998). In this process and state, people's coordination of efforts is critical to basically achieve more than can achieved individually. Importantly, collaboration is a process that not only involves sharing and coordinating ideas for constructing something together: it has an emotional component which can facilitate or limit opportunities to collaborate. Here, the idea of collegiality, frequently connected to more intrapersonal approaches to collaboration (see section 2.2.1, p.36), is essential for collaborative activity to occur (Kelchtermans, 2006). All in all, this indicates that collaboration is

a critical component in the learning process to improve openness to learning, embrace new ways of thinking, network with others, and mainly support processes of teachers' professional development.

3.3.1 Collaborative practices

Collaborative practices, namely building trust, division of labour, and negotiation have been widely addressed in the literature (Mercer, 1995; Roschelle & Teasley, 1995; Dillenbourg, 1999; Crook, 2000). These broadly refer to the processes involved in the social coordination while people collaborate. The literature on collaboration refers to these practices as essential, integrated, and recursive within the collaborative process (Brna, 1998; Schwartz, 1999, Crook, 2000; 2011), because collaborative practices are blended in the social experience of collaborating; i.e. they are integrated within the rhythm, pace, and path of individuals' needs and have patterns that suit the context of each activity (Crook, 2011).

I focused on three broader practices, because they cover the main aspects involved in the collaborative process and are also pertinent to theorize regarding collaborative activity in a wiki. I argue that these practices are central for teachers' learning because they grant possibilities, for example, for networking with other teachers, shaping professional identities, revisiting beliefs in teaching, and co-constructing knowledge.

3.3.2 Building trust

Crook (1999: 114) notes that collaboration involves "a state of engagement" in which people mobilise their natural capacity for building common knowledge, pointing out that a key and initial condition for this to happen is the fuller understanding of the presence of the other (Littleton & Häkkinen, 1999). This state of engagement, or trust, as described by Underwood and Underwood (1999) in a study on factors affecting cooperative and collaborative work in children around computers, tells of the importance of feeling safe and at ease for opening up one's thinking to others.

Scardamalia and Bereiter's (2006) ideas of a knowledge-building environment introduced the notion of collective responsibility, suggesting that, to engage others in collaboration, "the responsibility for the success of group effort must be distributed across all members" (Scardamalia, 2002: 2). That is to say, collaborative activities (e.g. problem solving in a wiki) must be presented, executed, and finalized as a joint achievement to create a climate of responsibility, implying that each party needs to know how essential he/she is for the other's development. Wenger's (1998) communities of practice explicitly support the idea of mutual engagement with a focus on the sustainability of a community over time, although not referring to collaboration explicitly. In this regard, I argue that forming a community implies collaboration in the whole sense of the word. Therefore, Wenger's ideas of *enabling engagement* by setting a right and secure context for working, acknowledging *diversity (*i.e. everyone is different, with individual aspirations, skills, etc.), and working toward a common goal or *joint enterprise* are important considerations when building trust in joint online activities.

Symmetry refers to the extent to which one person has similar skills, status, or (more or less) knowledge regarding the performance of some action (Dillenbourg, 1999). As such, the quality of interactions will depend upon "the co-ordinators" made possible by the local available resources (Crook, 2000: 169), or, as I argue, the mediational impact of the other. This means that people can collaborate better if the "focal point for coordinated activity" –such as a person or a symbolic tool (ibid:176)– acts as a useful representational support, perhaps externalizing actions, comments, or practices significant to the other. To build trust, people need to show an "intersubjective attitude" towards collaboration (Crook, 2000: 168), i.e. an individual willingness to collaborate that directs their attitudes sympathetically toward constructing a desired product. This attitude can be linked to the concept of agency, more specifically to the idea that agency is expressed through the motivation to produce and contribute, which Schwartz (1999: 6) terms "productive agency". Therefore, a teacher instilling that productive agency in a group (e.g. by seeking assistance, offering support, making questions), will give others the opportunity to collaborate, hence generating trust. It is important to consider that asking questions, showing understanding, or having an optimal space to express ideas does not mean that collaboration will flourish. To maintain this collaborative state, it is necessary to safeguard the quality of interactions, the individual ability to represent the other's agency, personal motivations, symmetry in interests and

needs, and the design of a collaborative task that evenly distributes efforts among team members (Brna, 1998; Scardamalia, 2002). Therefore, it seems that trust can both afford and remove opportunities to collaborate, suggesting that, for collaboration to happen and persist over time, affective, cognitive, and special conditions need to be carefully considered throughout the collaborative process.

3.3.3 Division of labour

Division of labour is a term used by Dillenbourg (1999) to define the differences between cooperative and collaborative learning. Basically, in cooperative learning, partners "split the work" to solve sub-tasks individually to then assemble and present their results as a final output in an individual way, whereas in collaboration partners "work together" to accomplish the tasks (p.8). Thus, the degree to which labour is divided to accomplish an activity defines the differences between collaboration and cooperation (i.e. the less division of labour, the more collaboration or vice-versa). Dillenbourg (1999) also defines two types of division of labour, the first being *horizontal,* which involves collaborative situations where people (such as teachers) work in a heterarchical ways (Roschelle & Teasley, 1995). For example, teachers in a wiki can adopt roles while working together, performing activities "into reasoning layers" (Dillenbourg, 1999: 8). This entails changes in roles during the actual performance of the activity; therefore, teachers require to be permanently coordinated to complete a task. As for the *vertical* division of labour, it mainly relates to cooperation and involves, for example, the same teachers dividing the work hierarchically to perform the task. This suggests that teachers adopt fixed roles from the beginning until the end of the activity, showing less coordination and fewer references among themselves, with individual efforts predominating. However, Dillenbourg's (1999) definitions have drawn criticism from authors suggesting that collaboration and division of labour should be approached as integral processes (Kirschner et al., 2004; Murphy, 2004), because spontaneous division of labour emerges when people collaborate (Brna, 1998) and because collaborative learning requires flexible divisions of labour (Stahl et al., 2006). I consider that Dillenbourg's distinction is useful to identify approaches to collaboration through technology use (e.g. in wikis or emails), because it specifies whether people adopt joint or independent roles for seeking solutions to problems in a collaborative activity. Specifically, this distinction shows that a vertical approach to the division

of labour involves little reference to others, with a tendency to work individually to achieve the collaborative goal.

3.3.4 Negotiation

Stahl (2003) concludes that, to define negotiation, it is essential to consider the setting (e.g. a classroom, a community of practice, an online space) and the people involved (e.g. students, teachers) to then advance an adequate definition of a knowledge building or problem-solving outcome. I agree with this suggestion, since teachers collaborating in online environments may engage in negotiation processes different from those of teachers working face-to-face.

Negotiation is regarded as a process, suggesting that people follow a course of actions to construct knowledge, achieve understanding, and solve problems (Stahl, 2003; Roschelle & Teasley 1995; Mercer & Littleton, 2007). This process may only occur if there is a "space for negotiation" that mainly defines what can be negotiated and how, to then build a shared understanding of the problem and its solution (Dillenbourg & Baker, 1996: 190). In this space, people can negotiate different aspects such as goals, understandings, decisions, and rules (Dillenbourg & Baker, 1996; Stahl, 2003; Mercer & Littleton, 2007), reflecting a productive and dynamic process of continuous interaction and gradual achievement (Roschelle & Teasley, 1995). Mercer and Littleton (2007) also refer to the space of negotiations, noting that ground rules for group respect, solidarity, and individual identity can effectively open and maintain what they call an "intersubjective space" (ibid:62), i.e. the plane where negotiations are generated without threatening the group by imposing anyone's views. As a matter of fact, Scardamalia and Bereiter's (2006) notion of knowledge building environment and Wenger's (1998) communities of practice theory touch on the importance of secure arrangements for negotiations (such as setting goals and acknowledging diversity). In the negotiation process, symmetrical interactive opportunities are important. Here, Dillenbourg and Baker (1996) explain how hard it is to achieve that by pointing out the ineffectiveness of assigning fixed roles to optimize specific skills, as proposed by Woods and Roth (1988, cited in Dillenbourg & Baker, 1996). Instead, they suggest giving people the same range of possible actions, thus suggesting that the course of decision-making should not be set in the early stages of negotiation.

Stahl (2003) suggests that, in the initial stage of negotiation, the person (e.g. a teacher) articulates and shares his/her individual perspective with a group, and that the group has the expertise and understanding to make sense of the ideas presented. This expertise and understanding involves the ability of group members to create "joint reference", which subsequently affects the interest, and therefore decision, of constructing a shared understanding of a given problem (Crook, 1999:106). The idea of joint reference, defined by Mercer and Littleton (2007:74) as a "shared frame of reference", involves people evoking past experiences, using resources, or acknowledging common knowledge that supports the achievement of a problem-solving activity. More importantly, joint reference helps people to "build on each other's ideas" and feel comfortable while doing that (Azmitia, 2000:186). Thus, teachers articulating individual perspectives and making references among them can be regarded as negotiation mechanisms.

A second aspect of this process involves one party not imposing his/her views regarding the problem(s) or situations presented, but rather arguing a position by reasoning, challenging others' understanding through disagreement, and attempting to convince the other with arguments (Dillenbourg & Baker, 1996; Dillenbourg, 1999). I found two interesting positions regarding the idea of argument as the starting point of negotiations. The first states that "conflict" is not essential to define a negotiation; instead, it is essential that people commit to a mutual goal of achieving agreement with respect to certain "objects of negotiation" (Dillenbourg & Baker, 1996:2), i.e. having a goal can start negotiation. The second view contends that an alternative point of view is essential for negotiation to flourish because the sources of differences help articulate perspectives to "reach a consensus" (Mercer & Littleton, 2007:63). These consensuses take the form of "repairs" (Roschelle & Teasley 1995:77), i.e. mechanisms people adopt to deal with problems or integrate others' perspectives. Expressing agreement, counter-suggestions, and assertions, conceding points of view, complying with a majority, and voting are among these mechanisms (Stahl, 2003; Mercer & Littleton, 2007). Thus, in this giving and taking of perspectives –negotiations (Wenger, 1998)–, people converge to make joint decisions, and in time promote them to develop a mutual understanding for constructive intents (Mercer & Littleton, 2007). In summary, negotiations are critical to unify understanding of the problem or situation discussed within a group. For this to happen, people first need to convey individual ideas in an unthreatening but intellectually

challenging space, which makes it possible to express concerns, beliefs, agreements, and disagreements regarding others' ideas. Thus, I am partial to Mercer and Littleton's (2007) ideas of alternative points of view as indicators for negotiation to start, but I also acknowledge that working towards a goal (e.g. finding solutions to classroom problems) may instigate certain aspects of negotiation (e.g. presenting a standpoint, building on others' ideas).

3.4 Reflection and reflective practice

Research on reflection originally derives from the work of Dewey, who highlighted the "active, persistent and careful" process of looking back into experiences and beliefs with the purpose of learning (Dewey, 1933: 118), highlighting the experiential, introspective, and procedural nature of reflection. Bolton (2010: 13) defines reflection as "an in-depth consideration of events outside oneself" and indicates it can be a solitary process or involve critical support. Schön (1987) noted that reflection adopts two perspectives: "reflection on-action", the thinking back on past actions, and "reflection in-action", the thinking process to reshape what one does in the moment. All in all, these considerations define the reflective nature of reflection along with the conditions and temporality where it occurs.

Several authors single out Schön's book (1983) "The Reflective Practitioner" as the one that put the concept of reflective practice in the educational spotlight (Fook, 2007; Strampel & Oliver, 2007; Daniil, 2013). According to Schön (1987), professional knowledge involves technical rationality or theory and professional artistry or the capacity to reflect in action. Therefore, reflective practice refers to people's capacity and awareness to bridge theory with reflection in order to improve professional practice (Fook, 2007). Over time, these ideas acted as a foundation to change the skill-oriented approach to education, shape theory-practice links for knowledge generation, and give people (e.g. teachers, academic, students) the power to decide how to learn (Boud, Keogh, & Walker, 1994; Wright, 2005).

The ultimate goal of reflective practice is to change and improve practice (Cooney, 1999; Fook, 2007) by promoting a sense of self-awareness and critical evaluation of practices (Finlay, 2008). Here, varied techniques and models (see section 2.2.2, p.38) embraced a set of technical skills to

undertake more effective professional decisions (Evans, 2002), demonstrating the internalization of reflection into daily practices (Claxton, 1999) to become a reflective practitioner (Schön, 1987). This assertion supports the inseparable reflection-collaboration relationship. That is to say, in the process of collaboration, a person will reflect constantly on what to communicate, who will decide whether to collaborate, or how to collaborate in relation to others, hence making reflection and reflective practice a complementary aspect of improved collaborative practices and the complex process of learning and vice versa. Reflection manifests itself in different guises, ranging from descriptive to more critical approaches (Hatton et al., 1995; Valli, 1997) as discussed in section 2.2.2 (p.38). This illustrates the procedural character of reflection, as people can be variously classed in relation to these levels depending on the connections made, awareness of situations, personal beliefs, socio-political influences, contextual constraints, and possibilities as they developed as professionals over time.

3.5 A framework for teacher's learning and collaboration

Teachers' learning is a process that happens in a social, cultural, and historical context (Vygotsky, 1978). This context directly affects the nature of the learning experience by particularizing *meaning* coherently within a larger whole or surrounding (Van Oers, 1998). Here, two aspects are important to consider: first, that context (directly or indirectly) influences the professional development situation in levels; second, that context is created when people engage in activities with others (Cole, 1996; Van Oers, 1998). Therefore, professional development is affected by relations of influence for contextual reasons and context is created in accordance with the interpretations of those involved. Figure 3.1 illustrates my visual representation of teachers' learning as an experience of social interaction. This figure includes the dimensions necessary for learning to happen and the place of collaboration as practice in this process. Broadly, I argue that, for learning and development to happen, teachers need to move into these dimensions by fluidly internalizing mediational tools, reflecting, interacting, and collaborating while participating in the social practice of professional development.

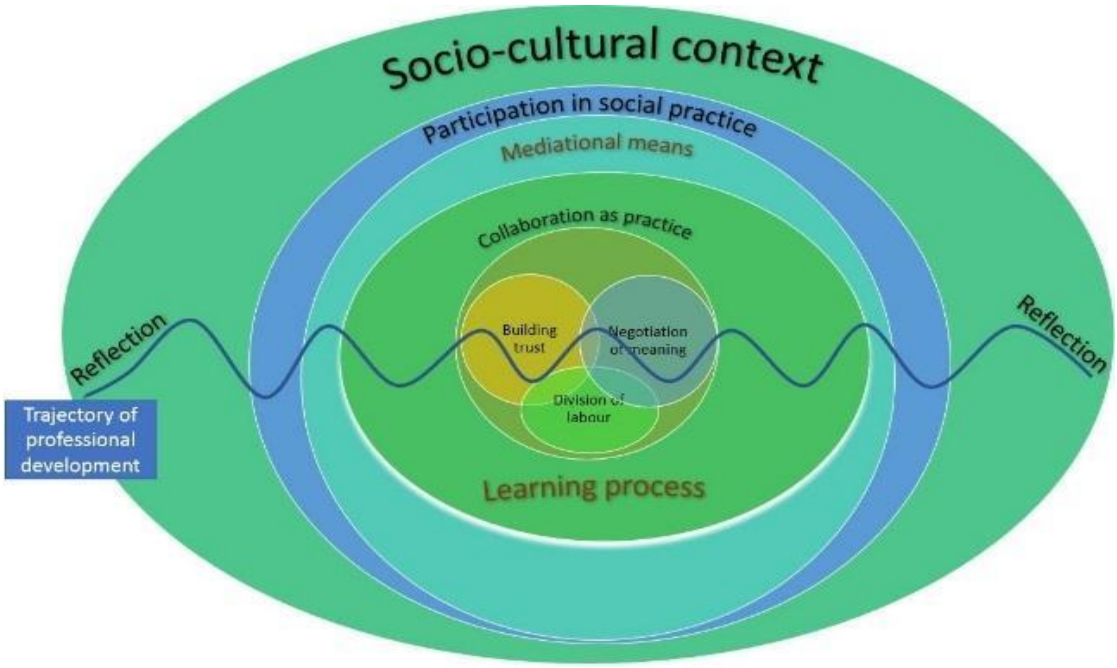


Figure 3. 1 Theoretical framework of teachers´ learning

In this figure, the various layers and dimensions represent the interrelated and converging nature of teachers' learning process. Learning is procedural; so, for learning to happen, a person (e.g. a teacher) needs to participate in the social practice of professional development, thus engaging in an active experience of negotiation of meaning through social interaction with others while taking part in the social situation (Wenger, 1998; Dreier, 1999). This practice is mediated by the use of tools, with language being the most powerful for mediating learning in social practice (Ivic, 2000). People, technologies, and cultural artifacts can mediate this process of meaningful negotiations in implicit or explicit ways (Kozulin, 1998; Lantolf, 2001; Wertsch, 2007), thus supporting, guiding, stimulating, and situating the learning experience.

Collaboration as practice stands in the centre of this process with three dimensions: *building trust,* which represents the emotional components for collaboration to happen (Crook, 1999; Underwood & Underwood, 1999); *negotiation,* signifying the coordination of efforts to achieve common understanding of a situation or problem (Rochelle & Teasley, 1995; Crook, 1999; Mercer & Littleton, 2007), and *division of labour,* supporting the adaptation of roles within the collaborative activity, hence defining collaborative relationships to achieve learning or problem solving

(Dillenbourg, 1999; Roschelle & Teasley, 1995). In essence, for collaboration to happen (e.g. in online environments), people need to engage in a collaborative state that presupposes recurrent negotiation and trust-building, while also adapting and changing roles through the division of labour to support joint construction (Dillenbourg, 1999). All in all, this process supports the practical connection with learning in *interaction*.

Reflection involves an active and persistent examination of experiences and beliefs for the purpose of learning (Dewey, 1933). This process manifests itself at several levels (Hatton et al., 1995; Valli, 1997) and can occur in-action or on-action (Schön, 1987). Reflection is an ongoing process crossing all dimensions of the learning process; therefore, it recurrently affects relationships with the context, the social practice, participation, and the practice of collaboration. Here, when converging with collaboration, reflective practice encourages people to adopt mediational means as tools for learning. For me, it is reflective practice and collaboration that enable the learning process to generate development by giving meaning to people's actions, intentions, and attitudes in social interaction.

Finally, this theoretical framework has suggested possible units of analysis in this study, namely interaction and trajectory. In the second regard, Wenger (1998) and Dreier (1999), who advance theoretical perspectives on participation in social practice, and Rasmussen (2005), who addresses participation practically, invite us to understand teachers' learning as a multi-level phenomenon that involves the person in social interaction with other people (Ivic, 2000), the person in relation to mediational means like signs, tools, and artifacts, including language (Kozulin, 1998), and the person as part of social practice. Thus, theory has supported methodological aspects regarding the identification and analysis of what I call a *trajectory of professional development*, which represents a person's time spent, his/her relation to mediational means, and his/her participation in the professional development experience.

Summary

In this chapter, I have presented a framework to understand the process of teachers' learning and collaboration. This framework was envisioned, designed, and created considering online

dimensions. Teachers' leaning is understood as a socially constructed and mediated process, where other people and technology support the creation of meaning through social interactions for learning in a socio-cultural context. Professional development is understood as a social practice where meaning-making is socially created and affected by people's actions and attitudes toward the practice itself. Collaboration is at the centre of teachers' learning in this study, and as such it defines the actions, attitudes, and social relations involved in learning. In brief, collaboration and reflection cannot be approached separately when studying teachers' learning because, as practices, they complement and inform one another for improving aspects of learning leading to development.

The socio-cultural position presented in this chapter has framed teachers' learning through the understanding of interaction and trajectory. *Interaction* signifies the social relationships and relation with mediational means for learning, with *trajectory* signifying the developmental process necessary for learning to happen. In this context, the idea of participation in social practices becomes central to understand people's relationship with the world (Rasmussen, 2005). The next chapter touches on the issues of trajectory, participation, and interaction directly, while also presenting the action research methodology adopted in this study and the methods of data analysis used, which follow interaction and thematic analysis perspectives.

Chapter 4: Methodology and Methods

Introduction

In this chapter, I present a design framework to explore and understand the professional development process of a group of primary and secondary school teachers in Chile, while also informing my professional practices as a teacher trainer and facilitator within this project. The premise of my research design derives from the organized and organic intersection of three aspects: the philosophical worldviews informing your methodological decisions, the selected strategies of inquiry signifying your methodological decisions, and the research methods to address methodological decisions (Creswell, 2009; Crotty, 1998; Punch, 2009). Figure 4.1 below presents my visual adaptation of the research design triad in three distinctive sections (adapted from Creswell, 2009: 5). This adaptation is pertinent to clarify the complexity of presenting my action research processes and my participants' action research processes, orderly representing the research methods used in this study.

Section one introduces my approaches to research design in reference to my socio-constructivist philosophical worldviews informing the qualitative dimension of this study, the action research methodology, my aims and research questions, and my positioning in the research process. S*ection two* presents my action strategy, called The Wiki Project. Here, I describe participants' features with reference to sampling strategies, professional development activities with reference to data collection methods, and teachers' working methodology defined by an approach to action research for problem-solving. Mainly, this implementation supported an understanding of my professional practices regarding technology use for collaboration. Finally, section three reports how the data from the Wiki project was analysed by adapting and combining interaction analysis (Jordan & Henderson, 1995) and thematic analysis (Braun & Clarke, 2006) perspectives.

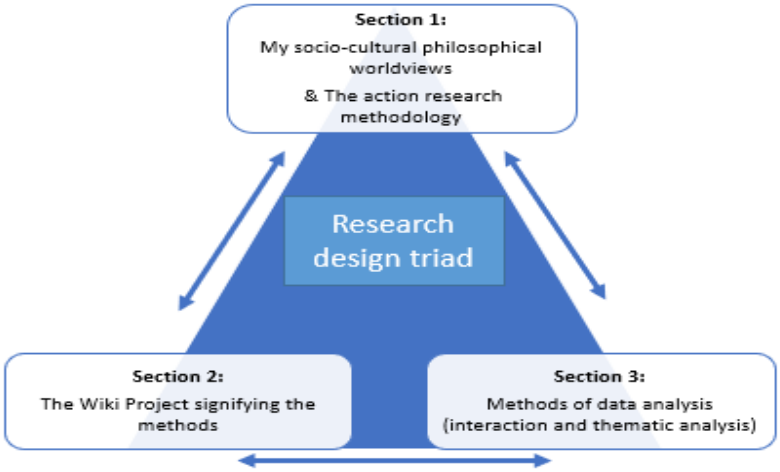


Figure 4. 1 Visual representation of the research design triad

4.1 Section one: Worldview assumptions & Methodology

Denzin and Lincoln (2005) contend that ontology, epistemology, and methodology are the generic activities defining one's stand as a researcher. Ontology represents the framework of ideas; epistemology, the specification of those questions; and methodology, the specific way to answer those questions. Based on this idea, this section explains my socio-constructivist stand in this research, representing the framework of my values and beliefs along with my professional decisions and actions aimed at satisfying them.

4.1.1 My philosophical approach – Social constructivism

In Chapter 3, I theorized that teachers' learning was a mediated process happening in a socio-cultural context, and where learning involved a process of co-construction through social interactions among people. It seemed natural then to situate this study in a constructivist paradigm (Lincoln & Guba, 2000: 163), specifically the approach to the social production of knowledge termed "*social constructivism"* (Burr, 1995; Clotty 1998). This approach represents an integrative, articulated, and emancipatory perspective about my way of conducting research, making it appropriate for a study that does not overemphasize the matter of individual minds for constructing our social world or truth (Burr, 1995), instead focusing on the co-construction of knowledge through reflective and collaborative means.

Ontology refers to the way we see reality (Lincoln & Guba, 2000) or, as simply stated by McNiff (2013: 23), the "way we see ourselves in our relationships with others". Social constructivism adopts a relativist ontology, that is to say, realities are constructed and because constructions are multiple, so are realities (Lee, 2012). This perspective suggests two important considerations regarding the role of reflection and knowledge generation in this study. First, research under socio-constructivist worldviews is value-laden (Mertens, 1998), i.e. I cannot separate myself from my values while doing research, furthermore, as reality is constructed, my values are always negotiated during research, suggesting on ongoing tension by perceiving myself as a set of "living contradictions" in the research processes (Whitehead, 1989:49). I consider that a socio-constructivist worldview has embedded a reflective component in the idea of construction that promotes that both myself and my participants adopt a reflective stand to satisfy our neglected values while interpreting each other's realities, our relationships with the context, and our theories of practice (McNiff, 2013), thus making social constructivism relevant for a study on collaboration and professional development.

Second, because realities are constructed, researchers perceive themselves in relation with one another in social contexts (Lincoln & Guba, 2000); first and foremost, meaning making is always social, arising in and out the interactions with the human community (Creswell, 2009). For instance, I regard my participants and myself as jointly making sense of professional development processes by considering our educational and working past experiences as professionals as well as the cultural, political, and social circumstances of the Chilean culture of which we are part. This is appropriate in ontological and epistemological terms because doing research under social constructivist perspectives considers not only the immediate reality of the eleven Chilean teachers in this study, but also the wider reality of teachers' professional development nationally and internationally, and the one created by us for knowledge generation. Foremost, I argue that a socio-constructivist worldview embraces my intentions to learn and develop professionally with my participants while doing research. This would mean drawing naturally from our experiences to construct knowledge through collaboration and reflection in that interrelated process, as presented in the theoretical framework of this study (see section 3.5, p.85).

4.1.2 Methodology: Action Research

The idea of practicality has accompanied the nature of action research from the start, suggesting that, by following a framework with interrelated principled stages, people such as teachers, researchers, or practitioners can seek significant solutions to concerns affecting their professional practice by inquiring, acting, and reflecting in cycles of development (Altrichter et al.,1993; Somekh, 2006; McNiff, 2013; Burns, 2015). With this in mind, I devised a methodology that worked for my practical purposes to research my concerns and practices as a teacher educator in an online environment by acknowledging my learning through a hands-on approach, feeding recurrently into action through cycles of development. More importantly, this was an approach that acknowledged my professional experiences for impacting the social action of teachers' professional development in Chile, or as simply stated by McNiff and Whitehead (2006: 92), an approach with an impact "out there" and "in here".

McNiff (2013: 25) defines action research as

> *"a process of people interacting together and learning with and from one another in order to understand their practices and situations, and to take purposeful action to improve them"*

This is a pertinent definition that emphasises two key aspects of action research relevant to study and development. First, constructivist perspectives that place social interaction as the core of people development, that is to say, professional development through action research is seen as an active process of doing, inquiring, and reflecting in collaboration rather than solely "rational deduction" for knowledge generation (Somekh 2006: 12). Second, the emancipation of knowledge derives from reflection on the individual and collaborative processes undertaken in research. In this regard, Lather (2006) suggests that epistemological emancipation comes after bridging the theory-practice gap through enquiry, acknowledging the importance of theories in the developmental process of meaning-making. McNiff and Whitehead (2006) add that knowledge can derive from three roots, the first being the object of the inquiry, i.e. you, the researcher, who constantly asks questions aimed at determining "how it comes to be known" and thus creates personal theories of practice (McNiff, 2013: 27). The second involves the practice itself, which is uncertain and negotiated, thus supporting the view that knowledge is created rather than discovered.

Finally, the importance of others, since action research involves working with others at all stages of the process, therefore knowledge creation is a collaborative process.

Broadly speaking, my action research involves two umbrella processes led by the components of *action* and *research*. McNiff (2013: 25) describes two parts of the "action" part of your research: what you do –the implementation of action that allows change to happen– and your careful thinking about your social, political, and cultural context to understand your actions. For its part, research refers to the set of processes adopted to understand and explore your inquiry; for instance, analysing data or generating evidence from data are part of research. As such, my action research involves a combination of research and thinking for understanding the processes in which we engage, rather than doing research for its own sake (Mann & Walsh, 2017), with the different research processes being in an emerging flux, integrated in a series of flexible cycles combining holistically rather than as separate steps (Elliott, 1991; McNiff & Whitehead, 2013; Somekh, 2006).

Figure 4.2 below outlines the action research model I followed to explore teachers' professional development with a focus on collaboration in online environments. In this model, the research plus thinking approach involves my exploration, planning, and reflection from the outset of the research to better understand the possibilities and challenges that technologies bring for the professional development of Chilean teachers. I also present an explanation about the meaning of each stage. This study is based on the main action cycle involving the implementation of my action to let change happen (McNiff, 2013), i.e. The Wiki Project. This implementation (Burns, 2015; Burns, Westmacott & Hidalgo, 2016) or intervention (Bullock & Smith, 2015) suggested my transformative action for further evaluation in section three in this chapter. An extended explanation of my action research model, including the cycles of development, is addressed in section 4.1.4. (p.95).

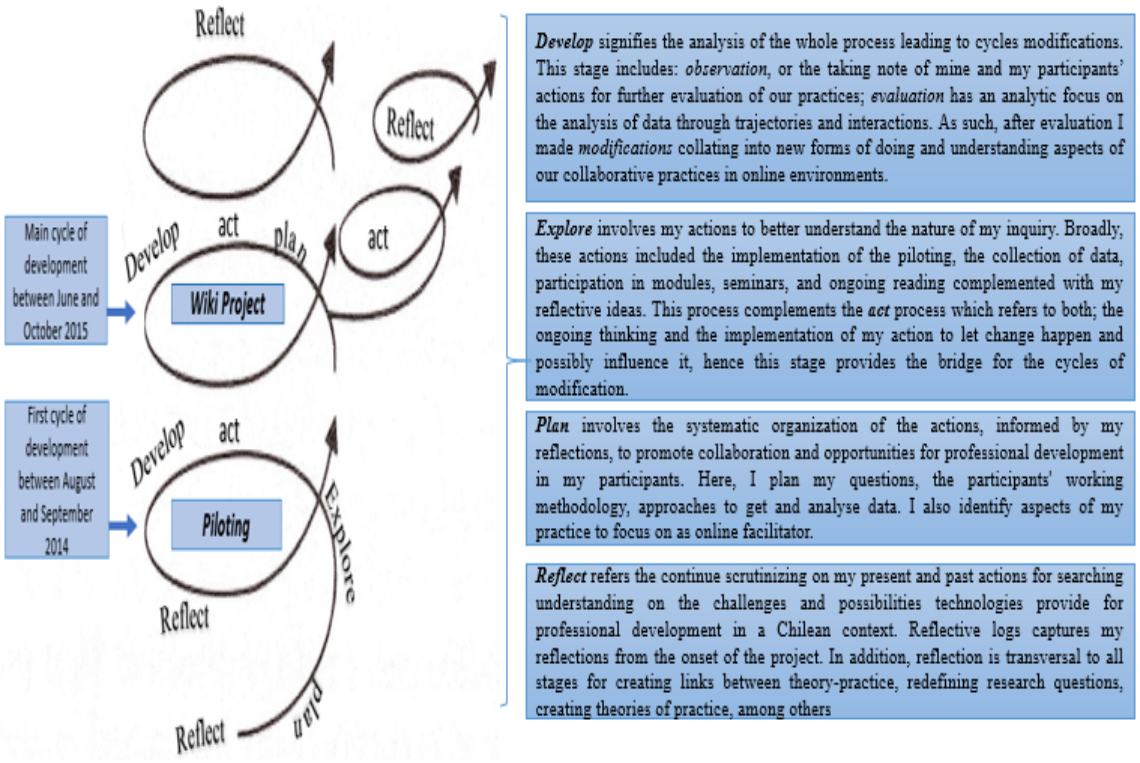


Figure 4. 2 My action research model to explore teachers' professional development (adapted from McNiff, 2013: 66).

This action research model broadly outlines the two salient developmental cycles defined by my actions to let change happen. The iteration of processes of interrelated practices per cycle represents the multifarious activity led by action, while the adjacent cycles depict the natural research evolution informed by actions while doing research (McNiff, 2013). This symbolizes the feeding on new ideas, changes in understanding, and actions. Reflection is presented recursively through the whole process, which is metaphorically put by Mann and Walsh (2017: 16) as "the reflective enterprise" to highlight its key role in knowledge generation in action research.

4.1.3 Research aims and questions

This study emerged primarily to explore how the professional development of Chilean teachers immersed in an evolving and demanding context is enriched and challenged by the technologies at their disposal. To do this, I adopted an action research methodology to explore the process of professional development in online environments and the manifestations of collaboration technology support in a wiki. This also gave me the possibility to explore my professional practices

as a teacher educator and facilitator in this study. To achieve this end, I implemented an action research strategy termed The Wiki Project, and I articulated three research questions to frame the focus of my explorations:

1. How does a technology-enhanced action research opportunity mediate the process of teachers' professional development?
2. How do collaboration and collaborative practices manifest through the process of professional development of teachers working in a wiki?
3. How do teachers approach support, guidance, and facilitation in the professional development experience?

These three questions are relational (McNiff, 2013). That is to say, they help us understand professional development and collaboration in online environments by taking communal action into consideration, hence supporting action research claims that regard the centre of the research as "we" (ibid:120), including participants and researchers. This notion is present in questions 1 and 2, both of which address my participants' actions on behalf of my actions as creator, designer, and facilitator of the professional development Wiki Project experience, where I simply became part of my participants' professional development processes. In question 3, the relationship is more salient by acknowledging our interactions in the professional development process. At a practical level, the questions are arranged hierarchically, ranging from general to specific; for example, question 1 focuses on the holistic professional development experience to explore contextual constraints and the benefits of technologies, professional practices related to technology use, and teachers' attitudes and actions toward The Wiki Project. More importantly, this question is aimed at generating insights into collaborative and reflective processes found in online professional development. This structure is strategic, situating professional development as the broader context, before framing the inquiry in the collaborative arena in questions 2 and 3 respectively.

4.1.4 My approach to action research

I follow an action research model with stages (see figure 4.2, p. 94) to achieve my aims and answer the research questions. These stages did not happen linearly, because they iterated and fed one

another recursively all the time. I adopted McNiff's (2013) skeleton model (see section 2.3.1.1, p.43) which represented the messy process of action research and allowed me to frame thematically some of the more salient actions in the research process but acknowledging flexibility all way through. Broadly, I themed 5 stages: reflect; plan; explore; act; and develop. Following these stages enriched my understanding, from the outset of the project, about the possibilities and challenges that technologies introduced in professional development with a focus on the collaborative practices in a wiki. More importantly, these cycles provide continuous feedback that informs my understanding of my professional practices, which involve my role as facilitator and the relationships associated with collaboration and technology-based development.

I identified two cycles of development. The first cycle in the model, which I termed *first cycle of development* (see figure 4.2 above), represents a *piloting* intervention conducted over five weeks between August and October 2014 with five primary and secondary school teachers in Chile. This cycle was guided by an exploratory approach (see section 2.3.1.1, p.43) to the issues of collaboration and professional development present in online environments while addressing my professional interests (e.g. the potential of narratives for reflection, uses of technology for collaboration and reflection) and satisfying my constructivist values of democratic access to knowledge for teachers in Chile. To do this, teachers and I engaged in collaborative practices in online environments such as a) using email for information sharing and support and b) working on two wikis, one for social interaction through a profile creation and further socialization and another for problem-solving in collaboration with others.

Online and face-to-face interviews served developmental and training purposes regarding wiki use and the action research methodology while also providing a channel for reflection through professional development activities (e.g. thinking question, narratives, and metaphor creation). This exploration supported a better understanding of my professional practices and the acquisition of new methodological ideas for the design of the project. For example, I included narrative components in interviews to support the externalization of critical voices in online settings, hence promoting my understanding of the feasibility of narrative activities online. More importantly, I look at collaboration differently with a focus on the implications, challenges, and benefits of working in an online context. This awareness was enhanced through iterative cycles of reflection

in and on action (Schön, 1983) while planning and implementing the piloting. This was captured in my reflective log (see appendix 9, sample 1). Overall, my learning benefited from my explorations in the piloting, which resulted in modifications to the main study that informed practical aspects of the implementation (e.g. better school time for teachers' engagement in work, number of teachers for focalized collaborative work), technological considerations regarding the uses of emails and wikis for collaborative purposes, and an awareness of teachers' attitudinal disposition –suggesting that showing an interest in collaborating does not necessarily translate in actual collaboration in a wiki, or even interaction in some cases. This study is based on the second or main cycle.

4.1.5 My researcher positionality and roles

Denzin & Lincoln (2005: 4) metaphorically associate doing qualitative research with the making of quilts to illustrate the laborious, non-linear, and intensive process of crafting a qualitative study. This is a metaphor that supports my experience in this study regarding my engagement in action-reflection cycles promoting constant thinking, changes in understanding, and a never-ending feeling of incomplete progress. Nonetheless, the qualitative dimension of action research provided the basis from which to explore professional development in practice as an evolving, iterative, and emancipatory process, where my participants' personal and collective processes of development were at the centre (Creswell, 2009). Foremost, and as stated in my philosophical worldview (see section 4.1.1, p.90), my ontological assumptions influenced how I positioned myself in relation to their professional development reality.

I adopted an insider position to established relationships with my participants (McNiff, 2013). This led me to support teachers' professional development while working on their projects and sustain The Wiki Project existence over time. This position was embraced when I designed, created, and implemented The Wiki Project, as I inexorably became an extension of it. I basically positioned myself as a peer, as a teacher adopting roles of support, guidance, and facilitation for the participants, rather than as an expert in the field of professional development. The facilitator role mainly concerned online environments, as reviewed in section 2.4.2 (p.52). Here, my role in wikis adopted two dimensions. The first I termed *instrumental/cognitive*, focused on supporting

methodological aspects and involved sharing my classroom anecdotes, giving advice, sharing material, and asking questions. This dimension also involved striving to add clarity to discussions through strategies such as using summaries and formatting the wikis' margins, font, colours, etc. The second dimension was centred on giving *motivational* support to promote interactions. Empathetic comments on teacher's realities, praising contributions, and agreeing on certain ideas were among the actions I used to appeal to the emotional side of teachers and thus encourage collaboration. McNiff (2013: 40) suggests that your positionality depends on your epistemologies or "the different ways to coming to know". This idea resonated with my socio-constructivist worldviews and therefore influenced the actions I performed in my attempts to access knowledge in interactive ways i.e. "I in relation with the other" (p.42). In this regard, some invisible actions like emphasizing my teaching experience in my wiki presentation (see section 6.1, p.171 and Figure 6.1, p.172) or addressing teachers as "colleagues" in email communication added naturalness to my positioning inside teachers' professional development.

My role as supporter and guide mainly referred to the companionship I offered teachers in The Wiki Project to assist and orientate their developmental processes through professional development activities, which I describe and explain in appendix 1 and section 4.2.2 (p.104), respectively. As such, my supporting and guiding actions involved interacting extensively with the teachers in both online and face-to-face settings to prevent feelings of isolation, being respectful toward their professional decisions to embrace their professional responsibility and providing non-prescriptive advice and recommendations to mobilize their developmental capacity. To sustain the existence and congruence of The Wiki Project over time, I was attentive to contextual challenges (e.g. school strikes, holidays) and I signposted the action cycle stages (see figure 4.5, p.110) with weekly email reminders.

Adopting an insider position helped me ensure good ethical practice in research. For instance, I informed teachers of our roles in the study right from the beginning, thereby addressing my position of power pertinently (McNiff, 2013) as expanded in section 4.2.5 (p.113). Nonetheless, having an insider role also brought challenges regarding the extent to which my design decisions in The Wiki Project (e.g. timings, scope of activities, or arrangement of teams) were influencing teachers' critical opinions, framing their creative capacity, or causing them to work with certain

colleagues. In this regard, I considered McNiff and Whitehead's (2006: 51) claims that action research is about "understanding influence" and exercising influence to improve practice; thus, I internalized the idea that other people's pertinent influence can sustain commitment, motivation, and growth during professional development.

4.2 Section two: The Wiki Project & Methods

The Wiki Project was a four-month technology-enhanced professional development opportunity implemented as part of my action research strategy (see figure 4.2, p.94) to capture and facilitate Chilean teachers' professional development processes with a focus on collaborative activity in online environments. The main objective of The Wiki Project was to connect teachers –who differed in terms of their region of residence, school subjects, and teaching experiences– through technology to seek a solution to the problems affecting their practices. Therefore, the project had a problem-solving and collaborative focus. In this section, I present a complete overview of The Wiki Project with references to sampling strategies, data collection methods, and teachers' working methodologies.

4.2.1 Participants and sampling procedures

I used "combination/mixed purpose sampling" (Gall, Gall, & Borg, 2007: 185), which involves both a convenience sampling procedure and a snowball sampling strategy (Mertens, 1998). Basically, I used my professional contacts with headmasters, colleagues, and student teachers to identify potential participants in different regions in Chile. This was important for granting research development opportunities outside of the capital, Santiago. The convenience of this sampling approach had its limitations in terms of the representativeness of the teachers' population, nonetheless, this strategy made it possible to incorporate views of teachers' realities in the North and South of Chile (see figure 4.3 below). The selection of participants was guided by my intention to give teachers who differed in terms of subjects, teaching experience, and working sectors an opportunity to engage in distance research and collaboration. To do this, I worked with a criterion involving the selection of teachers from (a) multiple regions, for inclusion; (b) different years of experience, to have various professional views about education; and (c) varied types of schools, to

promote a variety of perspectives on different contextual realities. This is relevant in a Chilean context where the provision of professional development opportunities involving research, collaboration, and technology use (see research context section 1.5, p.22) seems unbalanced to certain sectors outside ELT, restricted to private school teachers, and off-limits to less experienced teachers regarding collaborative opportunities (e.g. Red maestros de maestros). The number of participants was set in order to keep control of their participation, not lose track of them, gather sensitive data for analysis, and have a relevant sample to organize action teams for the collaborative work, all of which are considerations suggested in the professional development literature with an online and offline focus (Pratt & Palloff, 2008; McNiff, 2013). Similarly, based on my teacher education experience in online courses, I considered that the number of participants must not exceed twenty, because I could encounter problems when providing feedback and meeting specific needs of the subjects.

Eleven teachers, from eight subsidized and three private schools enrolled voluntarily in The Wiki Project. There were five females and six males, all with different amounts of teaching experience, ranging from one year to ten years, and contrasting professional profiles dictated by the specific expertise and qualifications in their subject areas and specific working context, all in all suggesting a miscellaneous group with distinctive professional features. Most of the participants had attended MINEDUC teacher training programmes with a skill-oriented and online focus (see table 1.1, p.23), except for two participants who had recently graduated as teachers, but had a language certification from MINEDUC as part of their universities' requirements. Three teachers complemented their school duties with extra jobs in universities, language institutes, and professional institutes, and three of them had extra duties inside the school as deans of discipline and department coordinators. This is common for Chilean teachers who want to earn extra income and fulfil additional professional competences. All the participants in this study held a BA or B Ed. awarded by private or public universities in Chile, and three of them have an M.Ed from a Chilean university. Two of the participants were mothers, and one was on maternity leave at the beginning of The Wiki project. Nine of them had previously engaged in research-type activities either in their undergraduate or postgraduate studies in seminars, university development programmes, or as part of MINEDUC in-service programmes. Teachers also reported using technology to deliver teaching contents, plan lessons, and interact with their colleagues for administrative purposes. Here, they primarily

described using emails to obtain and share information. In addition, teachers mentioned having prior experience with wiki technology for collaboration either in their preservice education through blackboard discussion forums or in their M.Ed. studies. Finally, one teacher (Camila) reported having used Google Docs for collaborative tasks at school such as the creation of tests, rubrics and textbook lists.

The sampling procedure was also guided by my decision to enroll teachers working in private and subsidized schools only. These schools provide possibilities for implementing research projects without municipal permission to adjust yearly curricular activities. In addition, these schools have varied educative resources, the number of students per class is usually 30 to 40 or less on average, and not 45 as in some municipal schools (MINEDUC, 2017b), which should result in better working conditions. More importantly, these schools are less likely to go on strike. This is a pertinent issue due to the agitated educational situation in Chile since 2012. With these ideas, in mind I selected teachers working in these institutions. Figure 4.3 summarizes the participants' main features in terms of age, school type, subject and level of teaching, highest qualification, and experience in action research and technology use for distance collaboration including wikis, discussion boards, and forums. It also outlines the geographical spread of the participants in four regions in Chile, complemented with numbers for clarity. Teachers' names have been anonymized for ethical reasons.

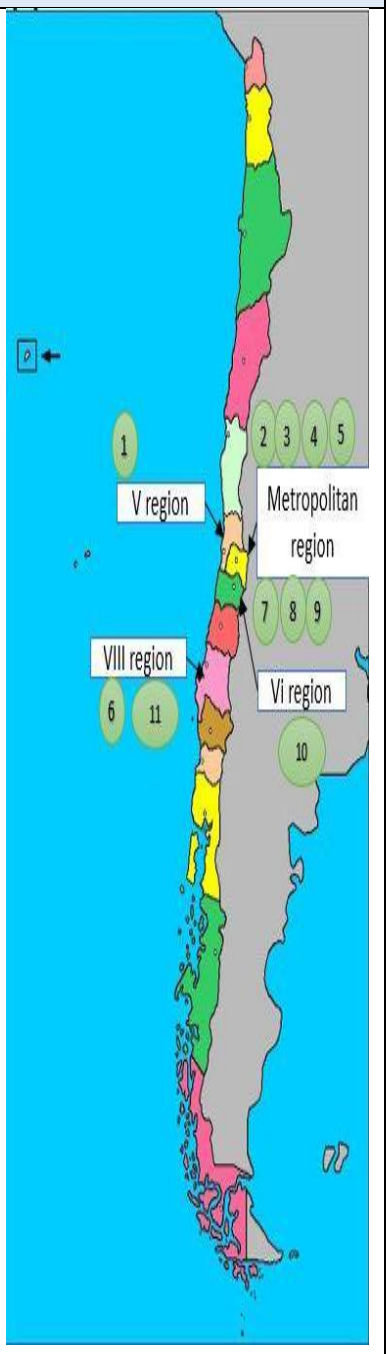
Participant's name and (age)	School type/ subject and level of teaching	Higher qualification	Prior action research experience	Prior experience with technology for collaboration	Geographical spread
1.Camila (36)	Private school/ English/Secondary	M. Ed. In applied linguistics	Yes	Yes	
2. Carlo (35)	Private school/ English/ Secondary	M. Ed. In applied linguistics	Yes	Yes	
3. José (36)	Subsidized school/ Spanish/ Secondary	Diploma in literature and writing	Yes	Yes	
4.Fernanda (26)	Private school/ English/primary	Cambridge ESOL certification	Yes	Yes	
5. Nelson (24)	Subsidized/ History/Secondary	Diploma in curriculum	No	Yes	
6. Claudio (34)	Subsidized/ Philosophy/Secondary	M.Ed. in ethics	Yes	Yes	
7. Nadia (28)	Subsidized/ English/Primary	Cambridge ESOL certification	Yes	Yes	
8. Carolina (25)	Subsidized/ English/ Primary	Cambridge ESOL certification	Yes	Yes	
9. Patricio (24)	Subsidized/ Sciences/Secondary	Postgraduate diploma in molecular Biology	No	Yes	
10. Danitza (29)	Subsidized/ Sciences/Primary	Postgraduate diploma in didactics	Yes	Yes	
11. Roberto (30)	Subsidized/ English/ Primary	Cambridge ESOL certification	Yes	Yes	

Figure 4. 3 Participants' features and sampling distribution

4.2.1.1 Team´s features

Teachers' collaborative work was carried out in teams. The *technology team* included Camila, Carlo, and José (see figure 4.6, p.113). Camila and Carlo were English teachers who shared a passion for ICT for teaching. In fact, Carlo had a website and Camila was the editor of the online magazine in her school, therefore, it was not surprising to see their positive attitude to wikis. José was a Spanish teacher who argued that teachers rely on technology too much and that it was necessary to return to more traditional teaching approaches. The *behaviour teams* included Nadia, Fernanda, Nelson, and Claudio. Nadia left the study after the identification stage, so only a limited understanding of her experience was possible. Of the remaining teachers, Fernanda was on her first year of teaching and worked with SEND students. She manifested an interest in technology and was enthusiastic about interacting with others in a wiki. Nelson was on his first year of teaching as well and was finishing a postgraduate diploma on curriculum, which kept him busy all the time. Claudio was a philosophy teacher with 8 years of teaching experience who also worked as an inspector[5] in his school. At the time of the orientation stage, his school was finishing a one-month strike, so he was reassuming his teaching duties. Finally, the *methodology* team was formed by two English teachers, Carolina and Roberto, and two Biology teachers, Patricio and Danitza. Carolina was in her first year of teaching, and as she had mentioned not having a home computer, all her contributions were made on her mobile device. Roberto had 7 years of teaching experience and worked with vulnerable students. He also worked some hours in a public school and taught an instrumental workshop in his Liceo[6]. He was applying for a M.Ed. in Australia and was interested in contacting teachers from other cities. Patricio had a year of teaching experience and lots of responsibilities. He was the head teacher of 12th graders, taught Biology, Physics, and Chemistry, and was planning to enrol in a M.Ed. programme in Chile. He reported having an interest in professional development but not in technology use. Danitza lived with his two-year-old boy and at the time of the study she was looking for someone to take care of him because she was resuming her teaching duties. She was motivated to participate in The Wiki Project to update her C.V. In summary, the participating teachers had busy lives comprising studies, maternity duties, and professional responsibilities, but they all had individual interests and motivations for developing

5 School inspectors' duties include guaranteeing the well-being of students in the playground, solving behavioural issues with the students, and talking to parents if students misbehave.

6 The name given to secondary schools in Chile in municipal, subsidized, and private education.

professionally. They had different views of technology use, with a positive attitude being the prevailing factor in them, especially in the technology team. One teacher had accessibility issues but could access the wiki from a mobile device.

4.2.2 Professional development activities and means of performance

Data were collected during the implementation of The Wiki Project through professional development activities in face-to-face and online settings. These activities adopted three broad dimensions. The first involved an *informative and instructive* component providing information about The Wiki Project (e.g. aim, working methodologies, duration) along with developing participants' understanding of the use of wiki technology and the implementation of action research (e.g. accessing and contributing on Google Docs, wiki, stages to follow in each cycle) (see appendix 2 A & C). Hence, this dimension involved coordinating perspectives, clarifying doubts, and mainly prompting a sense of support and motivation to work collaboratively. With this approach, participants' intentions, attitudes, and actions toward professional development and collaboration were captured. Second, *collaborative* professional development activities, involving two or more people, granted opportunities for socialization, problem-solving, and negotiation of ideas by including a goal-oriented and practical component in their design (Dillenbourg, 1999; Richards & Farrell, 2005) (See appendix 1, PD activity 7 & 9). The data generated in these activities was critical for understanding collaboration in online settings. Finally, *reflective* activities provided teachers with the possibility to look back and think about their actions, experiences, and emotions regarding their research processes (Mann & Walsh, 2017). Reflective activities raised awareness of teachers' beliefs, thoughts, and actions regarding their experiences in the research process, becoming a critical input regarding teachers' professional development in The Wiki Project. Reflective activities were approached both individually (i.e. participants engaged in their own reflective processes without the direct involvement of others) and collaboratively (with the support or active questioning of others); furthermore, and as I claimed in section 3.5, reflection is an all-encompassing process, hence all activities had a reflective component *per se* (e.g. see appendix 1, PD activity 2, 3 & 8). Broadly speaking, three means supported the implementation of these activities: wikis, emails, and (online and face-to-face)

interviews. Table 4.1 outlines the informative/instructive, collaborative, and reflective impetus of the activities while also showing their means of implementation.

Type of activity	Means of implementation		
	Wiki	Interviews (online and offline)	Email
Informative/Instructive		✓	✓
Collaborative	✓	✓	
Reflective	✓	✓	✓

Table 4. 1 Types of professional development activities and means of implementation

4.2.2.1 Wiki

Wikis made it easier for teachers to express their ideas by linking them to other ideas, therefore generating interactive data for fast, daily analysis in an easy to organize/access, inexpensive way (Brox, 2017). I basically created 2 main wikis. First, a *social wiki* where the eleven participants shared their photos, interests, professional needs, academic trajectories, and expectations regarding their participation (see figure 6.1, p.172). I used this wiki to identify collaborative practices linked to building trust or meaning negotiation. Second, a *problem-solving* wiki (see figures 6.3 p.177) offered possibilities to exchange ideas, documents, and photos to seek a solution to a set of problems outlined as a problem-solving collaborative activity. I expected teachers to perform a set of collaborative practices while finding solutions to the problems in the wiki. Figure 4.4 outlines some of the practices I expected teachers to perform after my input in the wiki. I present these practices in relation to the three dimensions included in my theoretical framework (see section 3.3.1, p.79). Basically, I expected teachers to mainly build trust and negotiate ideas to construct problem-solving strategies. I envisioned division of labour as part of the natural process of collaboration. All in all, focussing on the wiki makes it possible to capture collaborative activity more naturally in a free and an easy-to-access platform. This activity includes practices such as socialization while creating trust to collaborate, interaction, intention and connectivity while participants coordinate roles for collaborative work, and construction through the negotiation of perspectives to understand or solve problems. In addition, working on a wiki supported the continuous generation of interactive data about teachers' relationships, attitudes, emergence of

roles, and participation patterns, among others. All these elements were relevant for my intention to apply interaction analysis in wikis, as expanded in section 4.3.3 (p.125).

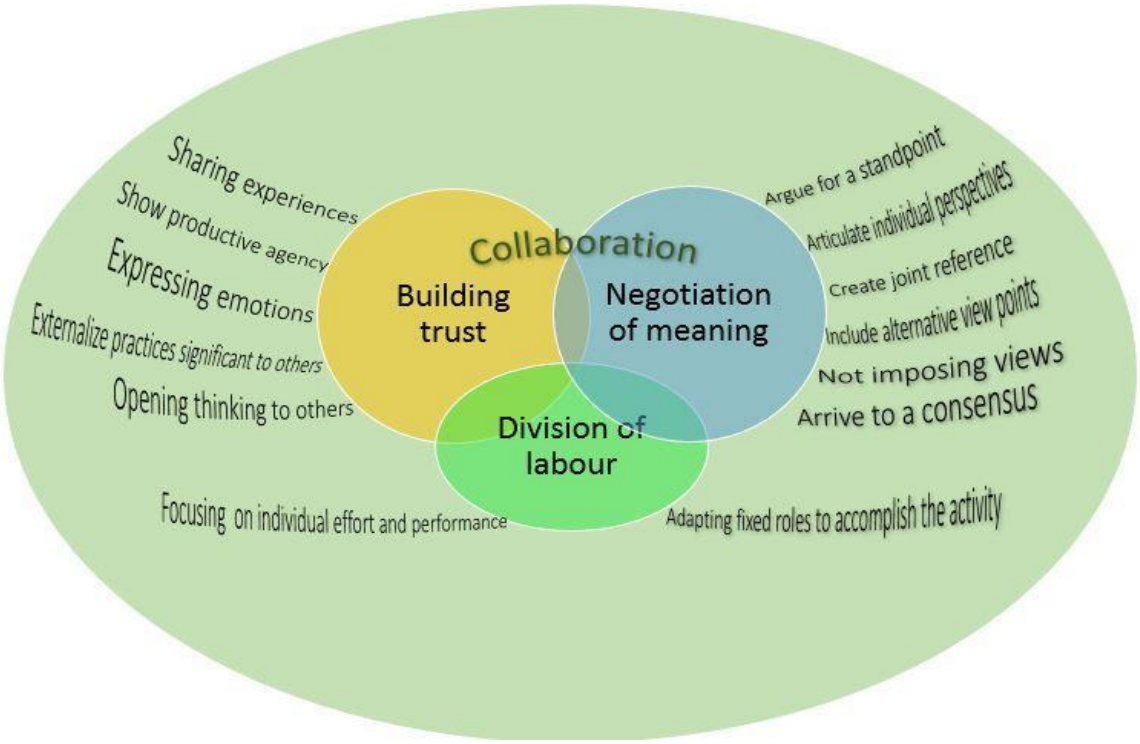


Figure 4. 4 My expectations in the wiki

4.2.2.2 Semi-structured interviews

Interviews served practical and professional purposes. In the first regard, they granted possibilities to get access to teachers, ensure that teachers' profiles fit the nature of the inquiry, get to know the participants face-to-face, and promote their engagement by embracing social presence physically. In the second regard, interviews facilitated a one-to-one approach for my informative and instructive intentions toward action research and work in wikis and for performing professional development activities mediated by me, thus pursuing clarity, confidence, and trust between us. Interviews adopted semi-structured dimensions, with the semi-structured component being convenient for generating a relaxed and conversational climate (Fontana, 2003) that allowed teachers to express their ideas with more confidence and freedom. More importantly, it granted me the possibility to structure the interview according to my needs by including stages for fulfilling the practical and professional purposes with enough flexibility to address my interests to include

narrative components in the professional development experience. For me, the narrative component provided good grounds to elicit quality reflections mainly because teachers were encouraged to narrate any topics that they might be interested in, without any time constraints or interruptions (Bold, 2012), and express inner feelings by telling of stories, experiences, successes, or challenges. I originally planned two one-hour face-to-face interviews with each participant, one in July –at the beginning of the project– and another in October 2015 –at the end– although the teachers' busy lives, and distance limitations affected their availability, which instead encouraged me to use online interviews in some cases.

Broadly, in the first round of interviews (see figure 1.3, p.28), I conducted nine face-to-face interviews in several Chilean regions and locations including libraries, cafes, schools, and universities. I ensured that the settings were quiet for eliciting better rapport between us and to support my narrative intentions. This encouraged our reflexivity to merge through our relationships in comments, which is a critical consideration when including narrative activities because aspects of interpretations of data can start in the interview process or while taking field notes (Clandinin & Connelly, 2000). I held a Skype interview with Roberto from Concepción on July 12, and here Skype eased the delivery of professional development material in real time through the writing and shared material tool, while the video option allowed a more realistic dimension to emerge in the interview. With Camila, we engaged in email exchanges from July 9 to the 13th, where I basically shared the professional development material with her and inquired into her concerns while she presented her problems. I would argue that the email modality did not affect her problem identification, nor her involvement in The Wiki Project, as later presented in her trajectory of professional development. For the second round of interviews in the last weeks of October 2015, I held five face-to-face interviews with Carlo, Fernanda, Nelson, Carolina, and Patricio, along with four Skype interviews, mirroring Roberto's online modality description, with Camila, Claudio, Danitza, and Roberto. José and Natalia had left the study by that time. José had some personal issues and left the study after collaborating in the problem-solving wiki, while Nadia stopped replying to my emails after the profile creation, leaving a limited perspective of her research documentation.

Basically, the first round of interviews had two parts. The first part in both the online and face-to-face modalities, lasted approximately 20 minutes for access, instructional, and informative purposes. The second part, lasting 30 to 40 minutes, involved engaging teachers in professional development activities by following a narrative framework. I adapted Jovchelovitch and Bauer's (2000) framework for narrative interviews, acting as a guide to elicit teachers' ideas in a structured way that suited the online dimension and to include flexible activities with visuals and metaphors (see appendix 2, B). In the activities, I started activating the topic of the narration by showing pictures of students in different situations (e.g. some looking bored, participative, organized) for teachers to link the photos with their realities and feelings. Then, I asked the teachers to create a metaphor for education, eliciting their inner feelings and values about the act of teaching. Then, I introduced the main narration by simply stating *"I would like you to speak freely about the following topic. These are some of the problems I face in my class…*". Here, I did not interrupt teachers but listened attentively and took some notes, boosting their confidence through respect and attentiveness. Teachers' personal styles emerged naturally: while some spoke freely and confidently immediately, others required further prompts from me (e.g. "how interesting", "tell me more"), a common situation in online settings, where extended narrations became conversations in the end. After their accounts, I elicited new and additional ideas "beyond the self-generating schema of the story" through active questioning (Jovchelovitch et al., 2000: 6); for example, I asked for further opinions on the problems with a focus on the problems a not on their actions to keep them from thinking that I was evaluating their practices. Nevertheless, in the final part of the interview, I asked *why* questions about previous actions taken to address the problems. The second interview adopted the same modality, but without informative considerations. I voice recorded all interviews with the consent of the participants.

4.2.2.3 Emails

Emails were included in the project to track and gather individual data of teachers' reflective process, as well as to keep them informed and engaged. Put simply, teachers needed a personal reflective tool to make sense of the research experience and link their emotions with their classroom context and their own development. Based on this diagnosis, I sent weekly emails with two thinking questions –"What have you learnt this week?" and "How can you apply your new

knowledge into your practices" (adapted from Wright & Bolitho, 2007)–, providing a flexible opportunity where answering the reflective emails is not a compulsory or demanding activity but a weekly option, and where teachers had a choice to share their thoughts with me or not. Emails also provided information about the research process, letting participants know of any updates or changes, an important consideration in action research because it demands clear channels of communication and clarification of information, especially when it adopts online dimensions (Burns & Westmacott, 2018).

4.2.3 Teachers' problem-solving methodology and timeline of research activity

Teachers' working methodology for seeking a solution to problems affecting their professional practices was determined by my pedagogical experience in the British Council and MINEDUC's Champion Teachers Programme (2013), reviewed in section 1.5 (p.22) and 2.4.4 (p.61). As such, the approach to action research that I present demonstrates my adaptation of action research to increase its accessibility for Chilean teachers who are immersed in a demanding educational system and have limited time or accessibility complications to get training and are willing to generate changes in their practices drawing from their experiences and contextual needs. A technology-enhanced approach to action research resonated with my practical ideas to design a model that (a) is *flexible* and adapts to teachers' time availability, their individual progression in research stages, and their technological expertise due to the online nature of the project; (b) is *comprehensive* for teachers who have (never) been exposed to action research and need a feasible framework with comprehensive activities for guidance; (c) includes *reflective* components at all levels to create links between practice and professional development as well as a better understanding of what they are doing, their concerns, new ideas, feelings, and expectations; (d) is *exploratory* and gives them the possibility to explore their contextual problems from different points of view, including theoretical perspectives and colleagues' opinions; and (e) is *collaborative,* promoting opportunities to negotiate ideas to generate knowledge and understanding with the support and guidance of others. Figure 4.5 below illustrates the action research model that teachers followed to solve an educational problem in their practice. Here, I define the meaning of the stages and some of the teachers' actions in the interviews, emails, and wikis to illustrate the flexible, comprehensive, reflective, exploratory, and collaborative approach adopted. I also include the

timeline of the interventions for clarity. This model is also based on McNiff's (2013) generative cycle presented in my action research model (see figure 4.2 p.94). However, I adapted the stages to the problem-solving nature of The Wiki Project and to the dimensions of online work. Read figure 4.5 from bottom to top for clarity.

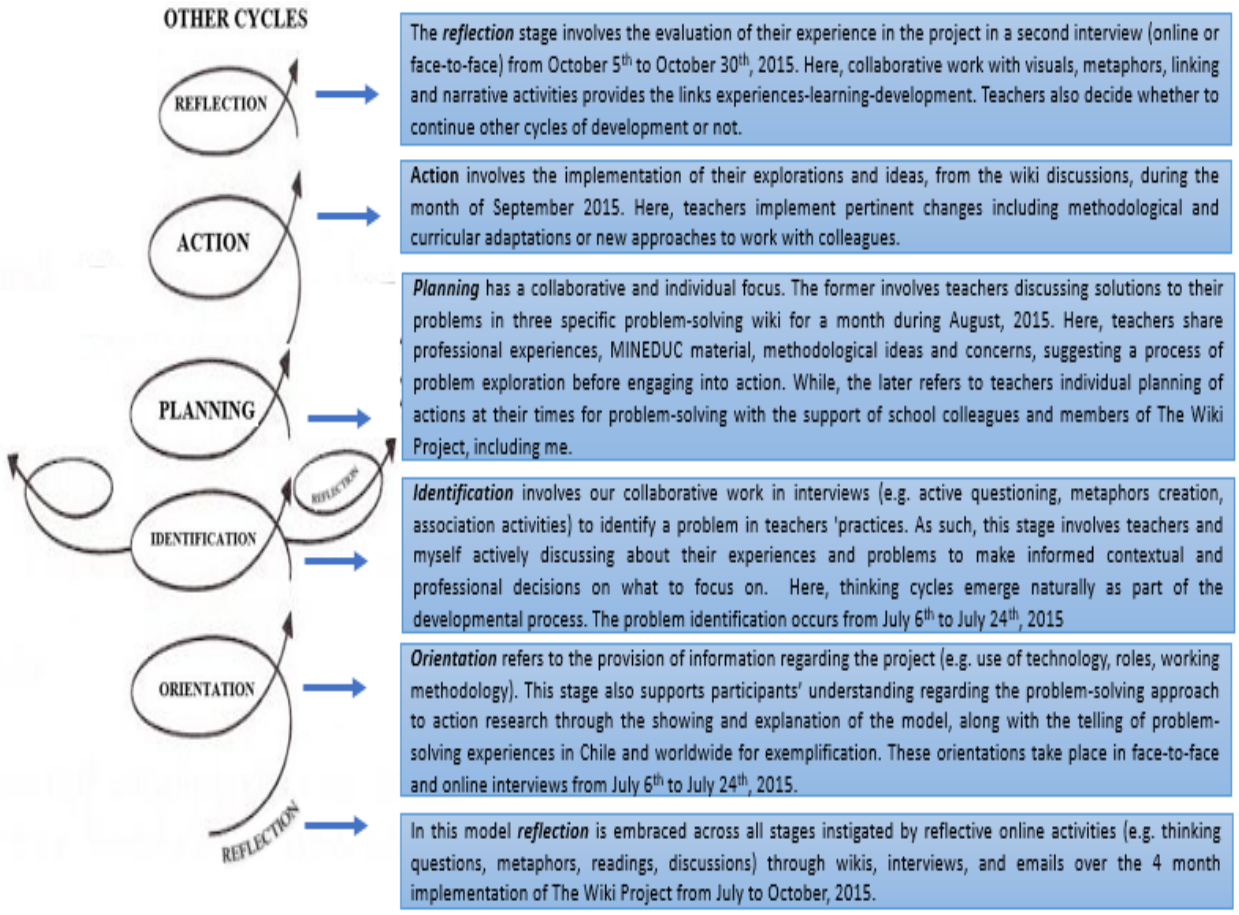


Figure 4. 5 The Wiki Project action research problem-solving working methodology

Five thematic stages, from bottom to top, outlined the umbrella processes of *orientation*, *identification, planning, action,* and *reflection* in one problem-solving cycle seeking practical solutions to professional concerns. However, it is worth noting that the one-cycle representation is just illustrative, as cycles emerged recursively while in practice, suggesting cycles inside the main cycle. Here, adjacent cycles attest to the changing and ongoing nature of teachers' actions while investigating their practices (McNiff, 2013), mirroring their re-evaluation actions, restructuring of ideas, and further reflective attempts. In this model, *reflection* is addressed across all stages, representing the evolving and iterative thinking processes of the teachers throughout the cycle.

This is promoted through weekly reflective emails, the ongoing wiki discussions in September, and my questions in the orientation and reflection stage interviews. The problem-solving cycle starts with an *orientation* stage to motivate participation, gain access to teachers' views, and develop an understanding of action research as a model for problem-solving, along with the potential of wikis as collaborative tools. The *identification* stage, during which I provide support, presupposes an active inquiry process into past teaching experiences to identify a relevant, usually contextual concern affecting teaching practices, although any professional concern can be addressed. *Planning* involves collaborative and individual actions, the first being the sharing of experiences with others, leading to the negotiation of ideas for knowledge emancipation and collaborative problem-solving. Therefore, this stage encourages teachers to explore their concerns by contrasting ideas, sharing material, or just clarifying the nature of their problems. For its part, the second stage involves taking those negotiations into account to organize ideas systematically, not individually but with the support of others. *Action* implies the practical implementation of those negotiations, therefore presupposing a change or modification in ways of doing. Sometimes a change in methodology or a pedagogical intervention can serve this purpose. Finally, *reflection* involves the evaluation of the whole experience, leading to new understanding of the problem (s) and ideally generating new developmental cycles.

This model also matches features of the approaches and models presented in the literature review section 2.3.1.1, p. (43). I acknowledged teachers' work as an *approach to action research* rather than "actual" action research because most of the research processes were adapted to the specific aim of solving a problem practically with the support of technologies in collaboration with others. As such, this model is *problem-oriented,* envisaging productive efforts on a single cycle that comprises further cycles within each stage. In this regard, the technological component and associated challenges in terms of distance, communication, and collaboration, among others, required a structured and productive model for organizing research work online, although continuity was always promoted to achieve a larger impact on teachers' practices. This model is also *autonomy-oriented,* addressing teachers' individual decision-making and professional responsibility recurrently for the success of their projects; for instance, all my emails and comments in the wiki were suggestions as opposed to prescriptions, an aspect strengthening professional responsibility for the participants' own decisions. Finally, the model has an

experience-oriented focus, that is to say, teachers' own experiences (as teachers or previous researchers) and those of other people's (teachers in the project, me, or colleagues) contribute to research processes. This is a decision emerging from my personal experiences, which showed me the motivational, productive, and cognitive potential of experiences for professional development. For example, teachers identified a problem as a point of departure, and since this problem was significant, they drew on their accumulated experience, which informed directly their research inquiry.

4.2.4 The collaborative work methodology in wikis

I created a social wiki enabling teachers to project features of their personalities by creating a profile, thereby personalizing the communications to come, so teachers knew each other in their own words before interacting (see figure 6.2 p. 173). Here, teachers worked as a whole group to establish a sense of group work community. I adopted a welcoming and motivational role in this wiki, although I did not interact further, thus opening up opportunities for them to socialize.

I created three problem-solving wikis to organize teachers' work with a focus on their needs in smaller teams, enabling personalized and interest-related interactions to happen. Having three wikis served strategic purposes for the generation of collaborative data from several sources and not only one. This was an important consideration for data collection, hence preventing the risk of insufficient participation or dropouts within larger teams. Basically, two criteria led the teachers' selection and the subsequent team arrangement process; (a) similarities among the teachers' classroom problems and (b) commonalities in teachers' professional profiles. For example, in the three teams I selected teachers who shared a similar working experience in primary or secondary levels, similar challenges in classrooms regarding technology use or methodologies, and similar professional paths. These criteria are aimed at motivating teachers to interact and collaborate by feeling themselves confident around peers who shared similar professional interests, educational background, and classroom-related problems. I arranged the group size from 3 to 4 teachers to provide feedback and satisfy their needs more effectively (Palloff and Pratt, 2003). To achieve this, I listened to our conversations in the interview and read Camila's email exchanges several times, identifying commonalities and differences among the teachers' issues. I also named the teams

distinctively, based on the most salient topic in their discussions: *technology*, *behaviour,* and *methodology*. These are the problems that guided their discussions:

1. *Technology team*, they discussed (a) students' bad attitudes when receiving criticism (b) teachers' rejection of technology use, and (c) students' problems with collaborative work.
2. *Behaviour team,* they discussed (a) meeting SEN/D needs in the classroom and (b) coping with bad students' behaviour and enhancing parental involvement in student education.
3. *Methodology team*, commenting on (a) the optimization of time in subjects with few hours and problems to cope with the demands of the curriculum, (b) the lack of analytical skills in science classes, and (c) difficulties enhancing oral skill in English classes.

Figure 4.6 illustrates the collaborative work modality in a social wiki and three problem-solving wikis, along with my role in the collaborative activity. I include the participants' names for clarity and arrows symbolizing the cyclical nature of our work.

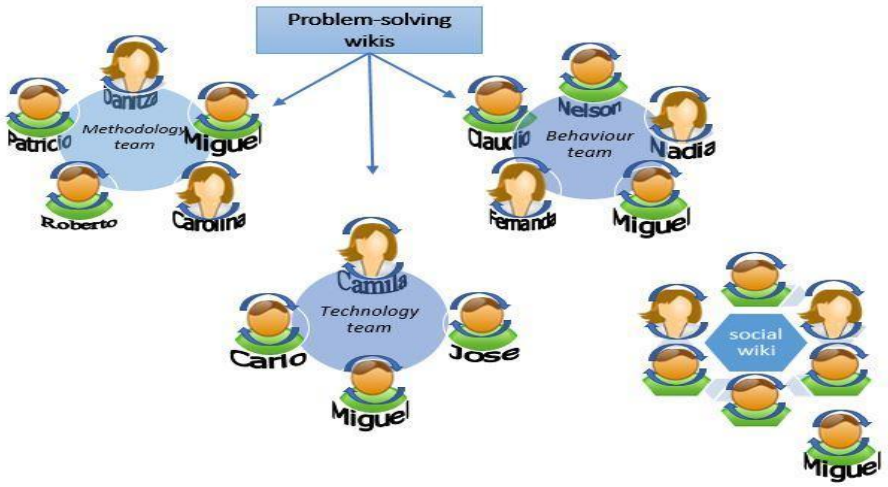


Figure 4. 6 Teamwork methodology in social and problem-solving wikis

4.2.5 Ethical issues

I obtained ethical clearance and followed the ethical guidelines of the University of Bristol School of Education (see appendix 3: Ethical guidelines) and BERA (2018) to identify pertinent "ethics in action" (McNiff, 2013) and adopt strategies to address them. These ethics in action stressed three aspects: (a) ensuring the data were collected with informed consent; (b) providing the best possible protection for the teachers; and (c) working with human beings in action research to avoid

harm. In the first regard, I considered that the best means to obtain consent (see appendix 4: Consent form) was in our face-to-face encounters, where I informed teachers about the research aims, their roles, the research working procedures, and their right to withdraw from the study. Here, I presented The Wiki Project as a professional development opportunity, which was part of my PhD research, although I emphasized the initiative's professional development focus. I also gave teachers time to inquiry into any professional aspects, such as practical benefits for them and the possibility of receiving a participation certificate or requesting additional information if needed. This last aspect was useful because one teacher required formal letters because of requirements from school authorities. I also obtained online consent from Roberto and Camila through emails and Skype respectively, by sharing and discussing the information with them and granting them time to ask questions about their roles and how their participation would impact their professional development.

Anonymity and confidentiality were critical considerations in The Wiki Project, mainly because of the online nature of the study. In this regard, the wiki is an open platform and many people could access the wiki links if they were shared with someone external to the study. Therefore, I talked to the teachers about the implications of sharing the links, as this would expose sensitive information about students, schools, or their colleagues. I believe this strategy lessened potential problems. I also ensured teachers' anonymity by inviting them to choose a pseudonym in wiki communication and explaining that their names would be anonymized in all publications, including this study, to secure the confidentiality of their school context.

Altrichter (2008: 77) mentions that action research "interferes in a social situation" and has an effect on other human beings, an effect that can be positive or negative. To prevent harm, I aligned my research interests with teachers' professional development realities by adopting an insider role (see section 4.1.5, p.97), thus preventing interference in teachers' professional practices contrary to their pedagogical beliefs. From the onset of The Wiki Project, I established respectful and honest relationships with the teachers by clearly explaining my roles as a supporter of their professional decisions, a facilitator in wiki interactions, and a guide throughout the methodological stages; essentially, I always stressed that their professional decisions were the core of their development. To achieve this, I gave them suggestions rather than direct advice and acknowledged all their

professional achievements. I also gave teachers the possibility to exercise their critical judgement through thinking questions. Finally, the representation of the teachers' ideas after narrating their problems also required me to adopt an ethical strategy. Here, I decided to include the original teachers' narrations as faithfully as possible. So, I ensured my translations were valid representations of their ideas (further explained in section 4.5 (p.133), thus re-presenting their ideas respectfully, without inserting my personal narrative "to demean, belittle or take advantage" of them (Sikes, 2010:16).

In this section, I have defined the outcomes of my planning through my action research strategy to capture teachers' professional development in online environments. To do this, I discussed the research questions, framing and guiding my explorations along with defining features of the participants and how they were recruited. I also explained the activities that the teachers engaged in, describing my data collection methods, to conclude with the teachers' working methodology through a team-based approach to action research for problem-solving. In the final section of this chapter, I define and discuss the approaches I adopted to analyse the data from The Wiki Project.

4.3 Section three: Data analysis

This final section reports how the data from The Wiki Project was analysed by adapting and combining interaction analysis (Jordan & Henderson, 1995) and thematic analysis (Braun & Clarke, 2006). Broadly, the analysis focused on two levels. First, a *trajectory level*, where three teachers' interview, email, and wiki data were analysed through thematic analysis, identifying the main professional development activity of these teachers over time in The Wiki Project to then create a holistic vision of their professional development experience. Second, an *interaction level* where the various encounters between teachers and between teachers and myself, in one social and three problem-solving wikis, were analysed through interaction analysis procedures to explore collaborative activity in wikis. The process was complex due to its iterative and evolving nature; therefore, I illustrate both analyses with explanations of key concepts along with illustrations of my actions. Table 4.2 below clarifies the procedure by showing the three research questions and the components and processes that explain these inquiries. For example, to approach research

question two, wikis provided interactive data for interaction analysis; based on them, I looked at the interaction as a source of knowledge (Jordan & Henderson, 1995).

Research question	Data	Kind of analysis	Unit of analysis
1. How does a technology-enhanced action research opportunity mediate the process of teachers' professional development?	Emails Wikis Online and face-to-face conversations	Interaction and thematic	Trajectory
2. How do collaboration and collaborative practices manifest through the process of professional development of teachers working in a wiki?	Wikis	Interaction	Interaction
3. How do teachers approach support, guidance, and facilitation in the professional development experience?	Emails Wikis Online and face-to-face conversations	Interaction and thematic	Interaction and trajectory

Table 4. 2 Analytical overview framework

4.3.1 Data management

Core data, as listed in the figure 4.7 below, includes all the interactive data from interactions between teachers and between teachers and myself in the social and problem-solving wikis; also, it includes my exchanges with individual teachers in online and face-to-face interviews, along with the various email exchanges, involving reflections, concerns, or simply interaction. These data forms the basis for the analysis of the interaction and thematic analysis. I also collected supplementary data in fieldnotes and through a reflective log. The former was based on the observations in face-to-face-and online interviews, while the latter captured the learning gained from the teachers' research processes and my own learning. These interpretative data, as termed by Conrad and Serlin (2011), fed the process of analysis by supporting interpretations of some actions, providing me with a source to add realism to the social situation in teachers' professional development trajectories as reported in chapter 5.

Type and amount of data	What did I use this data for?
Core data 14 face-to-face interviews lasting about 60 minutes each 5 online interviews lasting about 45 minutes each 12 pages of wiki profile presentations and social interactions 39 pages of wiki discussions 15 A4 pages of email exchanges between participants and myself	To explore teachers' professional development and their collaborative manifestations in online environments.
Supplementary data 10 A4 pages of fieldnotes 31 A4 pages with my reflections on action.	To give consistency and validity to the representation of findings.

Figure 4. 7 Interactive and interpretative data

4.3.2 Data analysis at trajectory level

Personal and life *trajectory* is a term coined by Dreier (1999), in his theory of trajectory of social practice, to refer to the "life span" (p.19) that each individual experiences as life stretches in a social time and space. In this trajectory, the individual person changes the configuration of particular social contexts, leaves some context behind, replaces new context, or even changes the context for life while participating in social practices and social contexts. That is to say, a personal trajectory involves a person (such as a teacher) participating in a sequential basis in social practices that lead him/her to take part in a long-term change. In my study, eleven teachers started a different personal trajectory when they decided to enrol in The Wiki Project. This trajectory had a professional focus comprising the changing configurations of meaning (Wenger, 1998) in the social practice of professional development as presented in section 3.2 (p.74). As such, the identification of this professional trajectory and prior analysis can provide insights into the processes involved in the professional development of teachers based upon meaningful social experiences (Wenger, 1998).

4.3.2.1 Trajectory of professional development as unit of analysis

Three trajectories of professional development constitute the unit of analysis used to explore the process of professional development in this study. In my theoretical framework (see figure 3.1, p. 86), I argued for a view of professional development as a mediated process where, for example, people and technologies concurrently affected our relationships with learning and development. I

also theorized about the role of social interaction for the construction of meaning and the importance of considering a person's social participation to better understand learning and development more integrally (Wenger, 1998; Rasmussen 2005). Based on these ideas, I termed the integration of those aspects "a trajectory of professional development" –the time spent by the teachers in the professional development experience (The Wiki Project). For these reasons, it came naturally to analyse trajectories of professional development to achieve a global understanding of what happened in The Wiki Project considering the multiple dimensions of learning (Rasmussen, 2005), that is, from a developmental, contextual, meditated, interactive, and participatory perspective.

For analytical purposes, I selected the trajectories of three teachers for further examination. This selection had a participatory and sequential basis (Furberg, 2016). The participatory basis addressed the "active role of participants" to take the lead in their development and make conscious decisions to improve their practice (McNiff & Whitehead, 2006: 13). Thus, I considered teachers who contributed to the wiki, replied to my emails, acted on my support, shared concerns and success with me or others, and were metaphorically *visible* during The Wiki Project. In this regard, I also acknowledged the participation of the teachers outside the social practices created in The Wiki Project. For this, I considered each teacher's account to access participation structures in social practices outside the scope of our interaction. In a sequential sense, I addressed the notion of uniformity of data; i.e. data (interviews, emails, wikis) can be arranged sequentially without major gaps for understanding the history of processes. Although it is true that the online dimension can produce blurred periods where teachers work more autonomously, preventing access to the social experience, the three trajectories fairly replicate teachers' actions.

4.2.2.2 The analytical procedures of the trajectory

The analytical process adopted inductive perspectives and theory-based dimensions (Rasmussen, 2005). It was theory-based because I worked with theory-based lenses to understand collaborative activity in a wiki, expanded in section 4.3.3 (p.125) and 4.3.3.2 (p.128). It was also inductive because my primary purpose was to search for outcomes from the bottom up (Clarke & Braun, 2013) in a more systematic and orderly way across the data, thus supporting:

(a) the reduction of data, because the dataset was large, including interviews, emails, and wikis which were complex to approach as a whole (Jordan & Henderson, 1995)

(b) directly identifying area of professional development and collaboration, because the sheer variety of activity in the wiki made it difficult for me to identify professional development patterns clearly.

(c) the establishment of clear links with my research objectives regarding professional development activity in The Wiki Project. (Thomas, 2006)

My analytical aim was to identify the professional development of teachers through the technology- enhanced action research model. Therefore, I worked under the assumption that the social practice of professional development was socially constructed, generated, and embedded in interactions (Linell, 1998); in other words, through the analysis of interaction I was able to access teachers' specific manifestations of professional development to then place and analyse them in a sequential basis or trajectory to construct a holistic and meaningful view of professional development processes. The process was complex and iterative; therefore, I will represent my analytical actions through steps for clarity.

Step 1: Data organization

The first step before the analysis was organizing the core data (see figure 4.7, p.117). Figure 4.8 shows how I input the interviews, emails, and wikis into the NVIVO software package in separate folders.

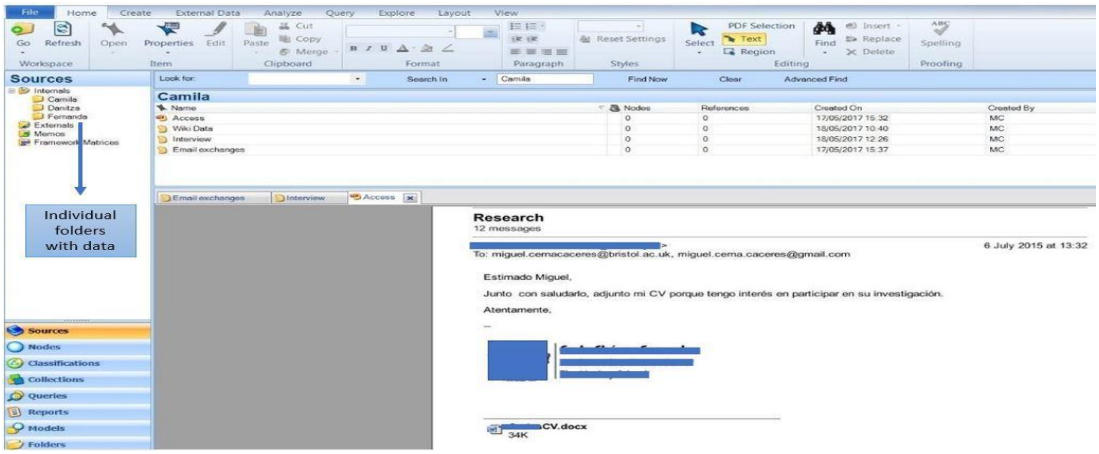


Figure 4. 8 Data storage and organization

I used NVIVO for *organization* of data only. This offered an accessible way to navigate data by clicking tabs, easing the visual representation of the data and securing their storage in a reliable place for further analysis. I opted for a traditional approach to thematic analysis, conducted manually and with the support of Microsoft Word templates as explained in step 3. Interview data were transcribed, while wikis and emails were copied and pasted into NVIVO for organization and clarity. I transcribed the interviews in the original language –Spanish– to preserve its "interpretative meaning" (Rasmussen, 2005: 90) and to capture some internal textual features like cohesion and coherence that could be lost in translation (Beaugrande & Dressler, 1981). For example, concepts like *chicos* meaning "little boys", have an affective connotation which can be relevant for interpretative purposes. I took notes during the transcription to familiarize myself with the ideas presented. These comments adopted summarizing perspectives with a focus on what the participants were saying, highlighting some unusual or relevant ideas regarding their professional development experience. Further considerations regarding transcription and translation are presented in section 4.5 (p.133).

Once I organized the data in NVIVO, I noticed that the professional development activities (see appendix 1) served as natural episodic divisions from which could enable me to approach smaller portions of interview data in an organized way. In this regard, Linell (1998: 87) comments that episodes can be seen as a sequence of "collective actions" since it takes, in general, two people or more to create a communicative situation. As such, these natural divisions also framed a social situation where perhaps mediational means were employed, or collaborative processes occurred, providing an important guideline on how to organize the data for further analysis. Thus, the data were divided into activities as shown in figure 4.9.

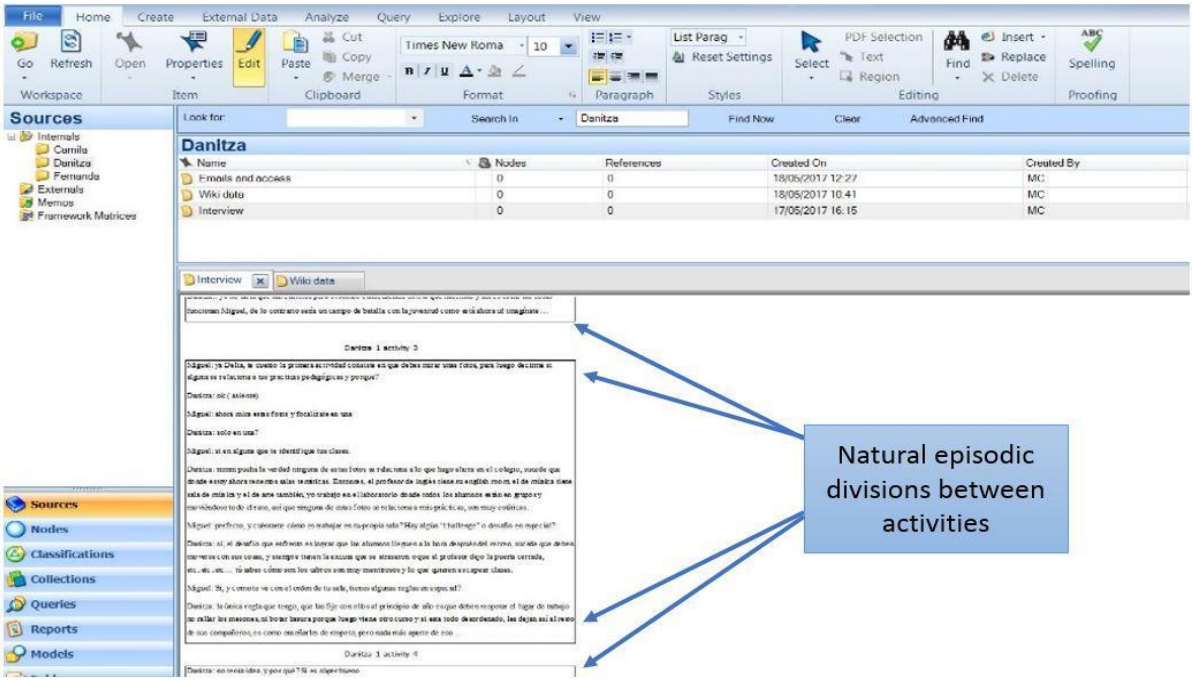


Figure 4. 9 Natural episodic division of interview data through the activities

Step 2: Coding the data and organization of codes

After repeatedly reading the three teachers' individual and collaborative data, I generated the first set of codes for each teacher. Figure 4.10 shows a sample of these codes on side A for each of the three teachers, along with a visual representation of the codes' reorganization in the three core action research processes on side B for Camila. For clarity, I include a transcribed version of these codes in appendix 5 A.

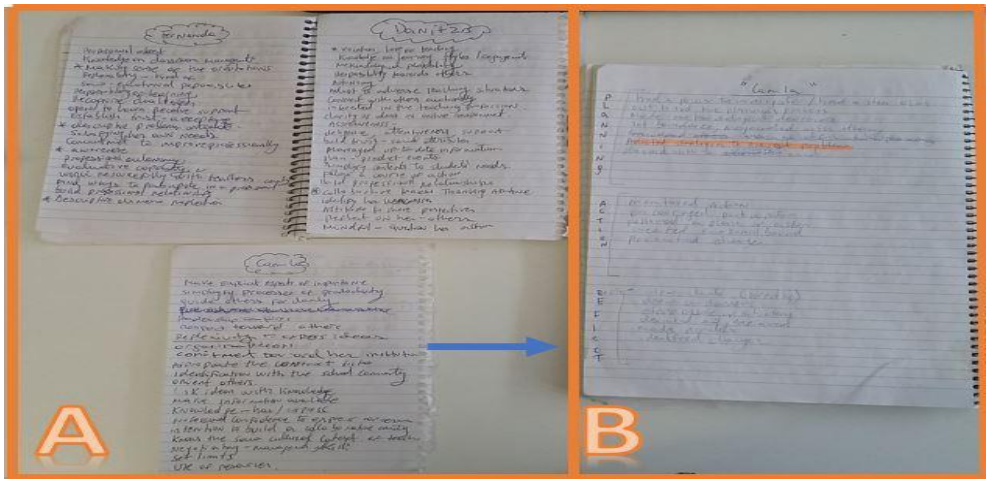


Figure 4. 10 The use of the coding framework for action research professional practices

I first coded and listed all the professional activities that emerged during the teachers' research processes. Here, I included actions like following sequential procedures or strategic planning and attitudes like being aware of the context or being self-reflective, thereby generating a list of codes for each teacher's research process. The list of codes was extensive, comprising over three pages for each teacher, stressing the need to organize them comprehensively for further analysis. To do this, I reframed these codes into super-categories according to the thematic stages of action research (i.e. the action research stages in The Wiki Project were used as an organizing tool). I originally focused on the core processes of planning, action, and reflection, without considering the information and identification stages, which were added later. In summary, with the thematic stages of action research in mind, I looked at the interview transcripts, emails, and wikis to generate codes for analysis (see appendix 5 B, Camila's first codes).

Step 3: Thematic analysis

Braun and Clarke (2006: 79) define thematic analysis as "a reflexive method of identifying, analysing and reporting patterns within the data". It is a systematic method that has been widely applied to gain an increasingly deeper understanding of the data (Punch, 2009). This analysis involves following certain steps to engage in a continuous reflective process starting with the generation of codes, where interesting features in the data are systematically identified by taking notes, creating labels, and adding numbers or abbreviations to then create interconnected codes to refocus on the analysis at a broader thematic level. Here, the use of tables, mind maps, software, or diagrams supports the visualization of thematic outcomes. Clark and Braun (2013) argue that, in this process of coding, reviewing, defining, and redefining codes into categories and themes, you understand the data less linearly and more reflectively by constantly pausing, reorganizing, and interrogating decisions while analysing. I engaged in this reflective process of identifying patterns across codes with the support of mind maps. Figure 4.11 shows how mind maps led to the creation of themes for Fernanda's information and problem identification stages and the manual approach I applied.

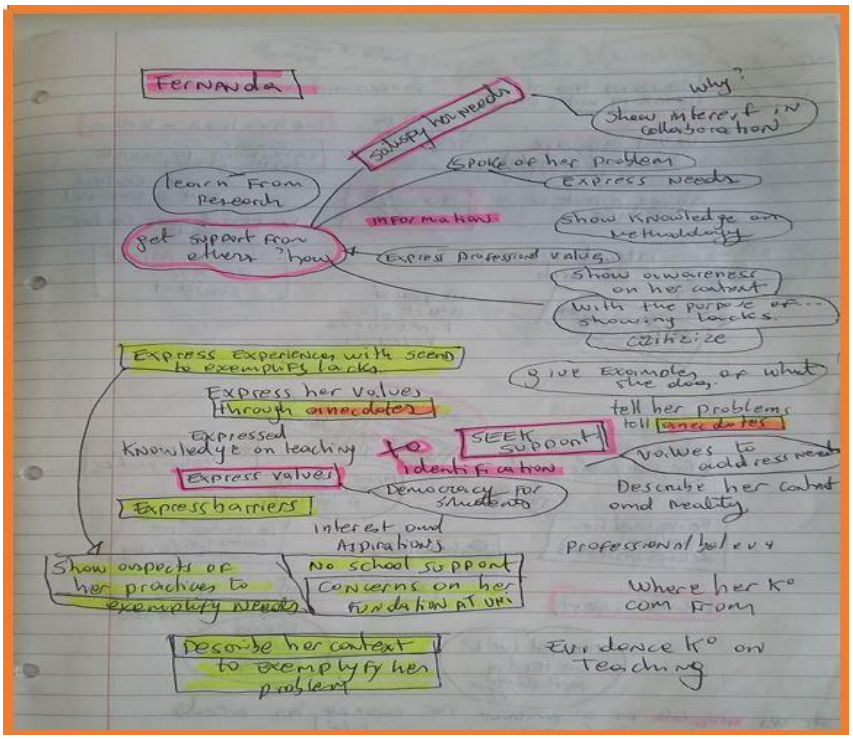


Figure 4. 11 Manual approach to mind maps for generating themes

The manual approach for generating themes was effective for me because it helped me to create connections through colours, shapes, and arrows while also supporting the interrogation of data while doing the analysis. For example, while analysing the information, stage codes converged to reveal that Fernanda met her support needs by showing an interest in collaboration and speaking about her school problems and criticizing aspects of her education. In contrast, in the problem identification stage, Fernanda's actions conveyed that she had looked for support by telling negative classroom anecdotes, speaking of her school's limitations, and expressing her values to satisfy her need for equal opportunities in class. Although a less tidy approach than NVIVO, I argue that this hands-on approach supported my *reflection in action* recurrently, throughout the whole iterative analytical process.

Step 4: The analysis of themes as trajectory

The final stage involved finding a pertinent way to analyse the themes for the three teachers' trajectories as a whole, accounting for their professional development processes in the Wiki project. To do this, I performed three distinctive actions. First, I created a Microsoft Word template

outlining the main activity areas in The Wiki Project (*orientation, identification, socialization, collaboration, planning, acting, and reflecting*), where I placed the main themes identified after the thematic analysis (see step 3). To identity the teachers' individual activity in the collaborative problem-solving wiki, I coded Fernanda, Camila, and Danitza's individual actions and identified the main themes related to their personal approach to collaborative work (see appendix 5 C, teachers' wiki codes). The second action identified the location of the themes in the trajectory (i.e. where the evidence was located in the data). To do this, I created a second column saying where (evidence) to write the location (e.g. profile, problem-solving (PS) wiki, interview 1). I finally placed the main themes in the template sequentially for analysis, with their location. Here, I refocussed my analysis on the themes already identified in the recurrent professional practices, trends in certain practices, one-off practices in the trajectory, similarities, and differences. Figure 4.12 shows a visual representation of the final themes in Camila's trajectory. To achieve this end, I engaged in several cycles of analysis, interpretation, writing, and rewriting of the trajectory, which I finally collated in the main professional development trajectories presented in Chapter 5, to answer research questions 1 and 3 (see table 4.2, p.116).

Areas	Themes	Where (evidence)
Orientation	Shows her professional expertise and interests	Curriculum, Email 2
	Expresses her interest in developing professionally	curriculum, Email 2
Identification	Starts establishing relationships to collaborate with me	Email 4
	Reflects on practices over the last year	Email 4
Social	shows her professional expertise to others	Profile
	creates collaborative relationship with others	Profile
Collaboration	Reflects about education and technology	PS wiki
	Supports others (Tells personal experiences, shares resources, etc.)	PS wiki
	Creates dialogue opportunities to satisfy her needs	PS wiki
	Exercises professional values (support)	PS wiki
Planning	Makes decisions to expand professionally	Email 7
	Creates links with me for support	Email 7
	Exercises professional values (respect, democracy, justice)	Email 9
	Takes professional decisions to avoid resistance	Online Interview 1
	Works collaboratively with colleagues	Online Interview 1
Action	Promotes change by leading development	Screen Shot
	Motivates her participants (better relationships for support)	Screen Shot
Reflection	Reflects about her practices	Online Interview 1
	Inquiries about aspects of my research (learns from others)	Online Interview 1

Figure 4. 12 Final themes in Camila's trajectory

4.3.3 Data analysis at interaction level

Interaction analysis is an interdisciplinary method for investigating human activities such as talk, nonverbal interaction, and the mediational use of artifacts and technologies for learning and communication (Jordan & Henderson, 1995). Furberg (2016) comments that this analysis focuses on the temporal organization of moment-to-moment and real-time interaction. These moments of interactions, or episodes as described by Linell (1998), are bounded sequences that create instances of learning that shed light on how "people collaboratively do learning and do recognize learning as having occurred" (Garfinkel, 1967 cited in Jordan and Henderson, 1995: 42). The main goal of interaction analysis is to identify patterns in the way in which people use the resources of the social and material world and how these resources interact to create knowledge or understand social processes (Jordan & Henderson, 1995).

The main assumption in interaction analysis is that "knowledge is situated in the interaction among members of a particular community" and that it is not located in the head of the individuals (ibid:41), an assumption that incorporates my socio-constructivist perspectives, positioning learning as a social process (Vygotsky, 1978). A second assumption indicates that "observation provides the best foundation for analytic knowledge of the world" (Jordan & Henderson, 1995: 41). As such, the use of videos opens possibilities to access the world of the participants for analysis of their interactions. For example, video has made it possible to explore the social interactions between teachers and students at school to examine knowledge building, meaning making, and argumentation (Rasmussen, 2005; Furberg, 2016). My study did not consider the use of video, instead employing wikis as a method of inquiry for collaborative activity. I argue that wikis involve people using utterances, taking turns, creating relationships, giving intentions, and engaging in socio-contextual practices beyond the communicative act itself (Fairclough, 1992; Titscher & Jenner, 2000), providing empirical evidence of naturally occurring activities such as learning, collaboration, and reflection. For these reasons, I extended the use of interaction analysis to wikis.

Jordan and Henderson (1995: 56) suggest applying some "foci for analysis" to see relevant aspects in the interactions in video recording. To do this, they suggest looking at the interactions through specific lenses to identify, for example, the use of artefacts in interactions, approaches to turn-

taking, or the impact of time or the task orientation on interaction (see appendix 6, Jordan and Henderson's suggested lenses). In addition, these authors argue that lenses can be adapted because they are just ways of looking for relevant aspects in interactions (i.e. lenses guide your analysis rather than prescribe what to look at). Based on this idea, Table 4.3 introduces how I adapted my research lenses to explore collaborative activity in a wiki. I provide an explanation of the foci of analysis to expand on their use in section 4.3.3.2, step 4. These lenses emerged from theoretical literature about mediation (section 3.1.3, p.71) and collaboration and its practices (section 3.3, p.76), all of which is relevant to look at collaborative activity in a wiki.

Lenses	Foci for analysis
Negotiation	This lens consists in exploring the practice of collaboration with a focus on the negotiating mechanisms that teachers adopted to interact in a wiki, including their references to others, references to ideas, use of tools, and approach to contributing. It also focuses on the participatory patterns that led teachers to engage or not engage in the negotiation process.
Building trust	This lens consists in exploring the practice of collaboration with a focus on building trust (i.e. teachers' intentions, emotions, attitudes, and attitudes to the collaborative activity). It also focuses on the actions that teachers perform to show their physical presence and the aspects of the social practice of professional development emerging in a wiki.
Division of labour	This lens consists in exploring the practice of collaboration with a focus on the roles teachers adopted to collaborate and their overall coordination to change roles for seeking solutions to the problems in the wiki.
Mediation	This lens consists in exploring mediation in online environments including language, the role of others, and the use of tools and its impact on collaborative activity.
Activity	This focuses on exploring the mechanisms that teachers used to convey meaning within the activity and the possibilities/constraints that the online context granted for collaboration, including the asynchronous nature of communication.

Table 4. 3 Research foci for analysis

4.3.3.1 Episode of interaction as unit of analysis

Furberg (2010) mentions that a *trajectory* is formed by the relation between units of moment-by-moment interactions or *episodes*. Ludvigsen et al. (2011: 59) add that these "episodes" are linked together, are distinctive, or are in a transition along life phases. Thus, trajectories are formed by a

sequence of collective episodes which are "oriented to, attend to, and bound to some kind of topic" (Furberg, 2010: 22). As such, episodes can be monotopical when the interaction is about a single topic, polytopical when the interaction is about different topics, and non-topical if the interaction is about anything in particular (Linell, 1998: 189). Non-topical episodes generally appear in the absence of common topics and can regulate aspects of the interaction like greetings or agreement expressions. For analytical purposes, mainly polytopical episodes were analysed to have longer chunks of interactions for analysis, hence exploring more effectively collaboration. However, monotopical episodes were also considered when relevant to the communicative events.

In my study, contributions are teachers' individual written actions on the wiki (see figure 6.4 p.179). These contributions can be linked, guided, and weaved by the contributions of others, and are frequently guided by a topic of activity. In addition, these contributions are formed by linguistic devices (Antaki, 1994) or smaller linguistic units used by people to support their ideas, convey meaning, avoid confusion, and negotiate meaning. These smaller linguistic units or *accounts*, as I have termed them, are critical to explore the way teachers collaborated in a wiki. Furberg (2010: 18) defines accounts[7] as the variety of linguistic devices that people use to deal with issues, arguments, or actions in interaction. In this study, accounts are the linguistic devices used by the teachers to create their arguments, negotiate ideas, solve issues, and explain their actions while contributing in a wiki. Accounts cannot be approached independently because an account taken out of an episode loses its contextual meaning, becoming irrelevant for analysis (Linell, 1998).

With these ideas in mind, my research regards episodes as the varied encounters between teachers and between teachers and me within a group or personal professional trajectory in a wiki, linked to a specific topic or actions, and formed by accounts within teachers' individual contributions. These are episodes that frame, separate, and exemplify a particular, important, or relevant situation for the teachers; therefore, they are critical to identify, understand, and explore.

7 Also termed segments (Griffin, 1993; Furberg, 2010) and units (Linell, 1998).

4.3.3.2 The procedures of interaction analysis

I applied an adapted interaction analysis to explore teachers' collaborative practices through their interactions in the wikis. It was adopted because I followed the primary steps to identify the unit of analysis (i.e. episodes with a focus on a wiki and not videos). I also adopted the uses of lenses to inquire into collaborative activity related to my specific needs in this study, an aspect that Jordan and Henderson (1995) suggest to explore interactive data more effectively. Technology and time were critical allies for the analysis. Microsoft Word helped me keep an organized record of the episodes into folders and subfolders in relation to the teams, which was useful to rethink the episodes of analysis over time and make pertinent changes without losing track of information. Microsoft Word also supported the visualization of emerging patterns, recurring or unusual actions, intentions, and emotions toward the collaborative activity inside the selected episodes by supporting the coding of data with colours and labels, a relevant action for detecting connections among codes for the generation of further categories and themes, as illustrated in figure 4.13.

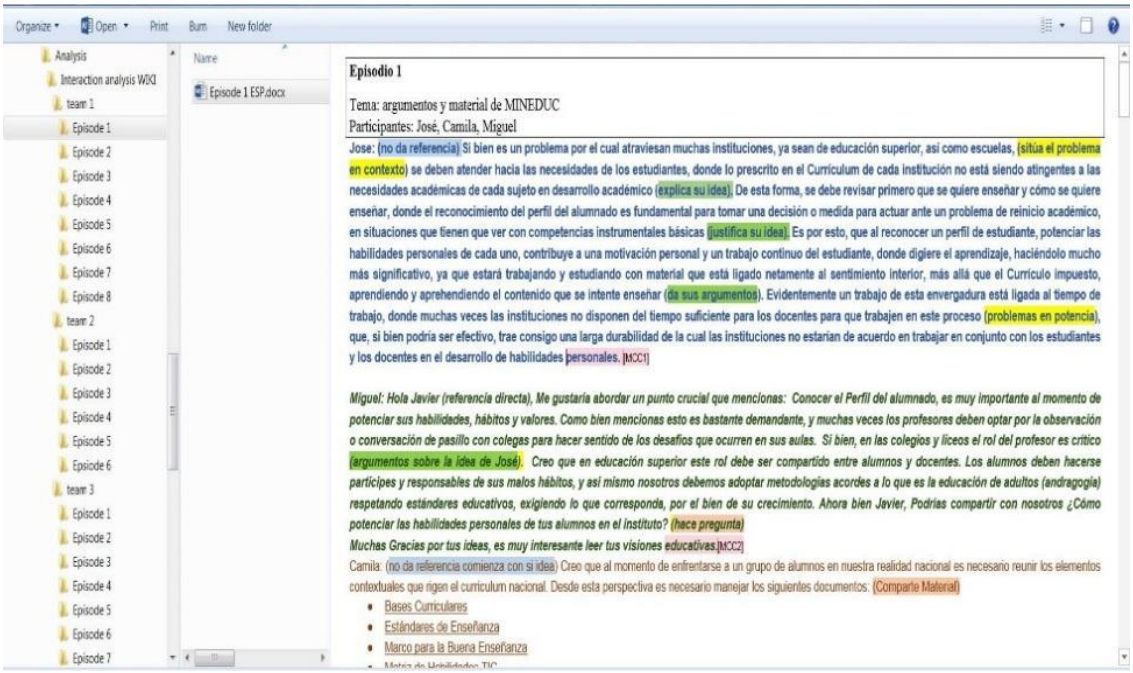


Figure 4. 13 Folders for data organization and use of colours and labels

The following step-by-step explanation illustrates the procedures that I followed. These steps are not prescribed in the interaction analysis literature presented in this study (Furberg, 2016; Jordan

& Henderson, 1995; Rasmussen, 2005), as authors tend to map in retrospect the broad actions that I adopted to obtain my findings.

Step 1: Get familiar with the data

Creswell (2009) notes that getting familiar with the data is the first step to visualize trends and get preliminary ideas about the nature of the enquiry. I read the wikis as a whole without interruption and wrote down general comments. For example, "who was interacting?" and "what were the participants doing or talking about?" These comments highlighted some initial moments of interactions and general topics in the discussion, while also providing information on the lasting elements of the participants' encounters for further analysis. The familiarizing process did not involve any kind of representation, reconstruction, or interpretation of data (Creswell, 2009; Riessman, 1993), as these could have affected the genuine course of interaction embedded in these primary data in the wiki.

Step 2: Identify and select relevant episodes for analysis

I have defined *episodes of interaction* as moments of interaction within a professional development trajectory which are framed, linked to, and guided by topics or actions (Linell, 1998), with this topic or action being of particular importance for the teachers. In this regard, the problem-solving activity encouraged teachers to discuss classroom-related topics to find solutions to their problems; nonetheless, teachers' discussions were diverse and did not necessarily address relevant aspects for them. For that reason, I followed two distinctive procedures to identify and then select episodes providing information on collaboration and professional relevance in the wiki discussion. First, I identify the episodes that illustrated *relevant moments in the teachers' work*. To do this, I read the second interview in detail and focused on the teacher's comments addressing the most significant or relevant aspect in the discussion/study for them and the strategies implemented (if any). I created a template that collated the aspects that the teachers' mentioned as relevant for them in regard to the wiki activity, to then identify trends of relevance in teachers' ideas. Basically, teachers valued five areas in the discussions because they (a) addressed personal interests such as conversations about technology use; (b) addressed individual needs by including comments on pertinent

methodologies or materials to use; (c) had a practical relevance (i.e. the ideas were applicable or provided practical insight into the problems); (d) regarded similar contextual aspects as school teachers, along with providing information about the broader educational context, including, for example, issues with MINEDUC policies or classroom challenges, and (e) included multiple perspectives, that is to say, teachers valued multiple contributions to a problem. This categorization and linking strategy made it possible to look for what seemed important boundaries in the wiki discussion regarding teachers' professional development (Jordan & Henderson, 1995) and originated a set of observable episodes within the trajectory of professional development in the wiki. Second, I designed some analytical criteria for episode selection. These criteria included longer interactional sequences, so I could trace different collaborative practices per interaction: (ideally) uses of varied mediational tools including videos, photos, and links to explore the impact of mediational means in interactions; clear beginnings and endings to identify specific collaborative practices and their relation to certain social practices in a wiki; and multi-topicality for sustaining a topic over time. This selection procedure focused on finding interactional data within what the participants had already identified as significant moments for their development.

Step 3: Code episodes into accounts

The third stage involved an analytical transition from episode identification to the selection of a relevant way of looking at the episodes for analysis. To do this, I considered an inductive approach supporting the analysis of complex data in the wiki and giving me the possibility to focus on my specific objective (Thomas, 2006), i.e. the identification and analysis of collaborative activity in the wiki. Wiki data were complex, having no patterns or uniformity; for example, some contributions followed a topic of discussion, although these topical threads disappeared and appeared later in the discussion, making it difficult to trace collaborative linkages, or some contributions were too extensive with no apparent connection to other ideas, when in fact connections were embedded in the large wiki contributions and less evident to identify. For clarity, I coded the data inside the episodes representing the various accounts that the teachers provided (see figure 4.13 p.128). In this process, new codes emerged recursively while I redefined them and made them more accurate or signifying of the collaborative activity in the wiki. I can metaphorically describe these coding movements as an "accordion-like process", because in my

search for codes, codes expanded and contracted, generating new codes as they started to reveal relationships among them (Butler-Kisber, 2010: 31).

Step 4 Forming themes and analysing them through lenses

After I identified the main codes in relation to the episodes in the teams, some trends started to emerge, forming themes naturally (i.e. the themes were formed according to what was observed to be representative in the wiki activity regarding collaboration). For example, in some episodes, the codes converged naturally into a descriptive orientation, while other codes mainly coalesced into an explanation of ideas, thereby forming the first umbrella themes for further analysis: descriptive and explanatory contributions (see Excerpt 6.2 and Excerpt 6.6, respectively). Rasmussen (2005), who explored students' learning trajectories in project work and ICT by following a similar interaction analysis framework but with a focus on video transcripts, suggested that her process of interaction analysis started as an open exploration (e.g. collaborative activity in a wiki) and eventually became "a more focused analysis of specific themes" (p.87). This claim mirrors my experience while exploring what was characteristic of collaboration in a wiki, where multiple codes delineated themes inside the episodes that I analysed by following Jordan and Henderson's (1995: 56) recommendations to apply some foci for "analysis framework".

The idea of looking through lenses was useful for me because (a) it gave me a tool to organize my reflexivity by narrowing my focus on aspects that I considered important to analyse in interactions in a wiki, and (b) it also supported the restructuring and organization of the themes in relation to collaboration in the wiki with the support of theoretical perspectives. Broadly, the foci for analysis concern collaborative practices (e.g. negotiation, division of labour, and building trust), the uses of mediational means, and the role of the online activity in wiki-based collaboration (see table 4.3 p.126).

To support my interpretations, some exploratory questions were necessary to avoid relying on the performance of the teachers in the wiki rather than on the holistic interactive activity. These touched on, for example, the impact of the activity, participation, and mediational means. Table 4.4 illustrates some exploratory questions I used as a guide to interpret collaborative activity.

Interestingly, the use of questions started as a rigid framework for interrogating collaborative activity in the wiki, evolving over time and becoming part of my analytical reflexivity. The analysis was conducted in Spanish and episodes were translated according to the main themes identified and interpreted, as I discuss in section 4.5 (p.133).

Lenses	Exploratory question
Negotiation	● What references did the teachers make between them in the wiki? ● Why did the teachers make those references? ● How did a certain reference affect the other? ● What other mechanisms acted as reference for negotiation? ● What approaches to contribution emerged primarily through references?
Building trust	● What attitudes and feelings did teachers express in the collaborative activity? ● What did these attitudes suggest and trigger in others? ● How did teachers convey their physical presence?
Division of labour	● What roles (if any) did teachers adopt in the collaborative activity? ● Did teachers coordinate their roles?
Mediation	● What resources (if any) did the teachers use to convey meaning? ● What actions did a particular tool engender when introduced? ● What kind of tools did teachers use to convey their ideas in a wiki?
Activity	● How did the activity affect teachers' interactions? ● In what ways did the online dimension of the wiki affect teachers' interactions and collaborative actions? ● What mechanisms did teachers use to convey meaning in the online activity? ● How did teachers' contributions shape the development of topics?

Table 4. 4 Exploratory questions used to examine episodes

In summary, the configuration and articulation process of selecting episodes, coding episodes into accounts, and forming and analysing themes through lenses enhanced a reflective approach where theoretical perspectives and evidence from the interactions in the wikis collided and expanded by revealing insights into collaboration for professional development in a wiki as presented in the multiple episodes of interaction presented in chapter 6.

4.4 Presenting the data

The trajectory and interaction levels of analysis sought to provide an understanding of the teachers' professional development from a procedural and mediated perspective through the teachers' multiple interactions in the social practice of professional development. Thus, it is important to explain my actions for fixing the flow of the social process "into a form that can be followed" (Rasmussen, 2005: 88) and perceived as real. In trajectories, I fixed the social situation by including chronological information with times and dates, acting as references regarding the

duration of research stages, contextual information (e.g. school holidays), attitude to participation, or teachers' changes over time. In addition, I included email, wiki, and interview *extracts* providing evidence of teachers' professional development in The Wiki Project such as emotional remarks and collaborative or reflective attempts, among others. These extracts are presented with the codes that supported the organization and location of evidence about participants' professional development activity. For example, social wiki extracts evidencing the building of trust (see section 6.2, p.173) include codes indicating the participant, means of interaction, activity, and the thematic code emerging from the analysis of the professional development activity (see appendix 7 for the list of organizational and thematic codes). The thematic codes were informed by theory (see sections 3.1., p.66 and 3.3.1, p.79) and emerged from the analysis of data as presented in section 4.2.2.2. step 3. I adopted two actions for presenting collaborative activity. The first involved setting the context where collaboration occurred; thus, a preliminary overview with screenshots of the wikis with descriptions, instructions, and participants' role is included. The second involved presenting the collaborative activity as it happened in the wiki. To do this, this I use *excerpts* signifying the episodic situation analysed. Here, I used numbers to locate the accounts analysed, dates to appreciate the trajectory of the interaction, background information to locate the interaction in context, and one annotation convention (e.g. (…)) to illustrate less relevant information taking out, as expanded next.

4.5 Comments on the transcription and field notes

I considered two principles when transcribing teachers' interviews into Spanish to then translate relevant excerpts into English. The first was that transcriptions should be clear and detailed for readers, also including some paralinguistic features (Patton, 2002). In this regard, Jefferson's (2004) annotation conventions (see appendix 8) promoted a comprehensive way to write down transcriptions with specific and clear details. For instance, I used periods to convey the divisions between key ideas, or commas when adjacent ideas complemented major arguments; also, the use of brackets for non-verbal activity was an important complement: because I used photos in some professional development activities, information in brackets supported imaginary representations of the social situation and added information relevant to the communicative event. Second, I strove to keep the original meaning as close to the original language as possible (Rasmussen, 2005). In

this respect, doing all the translations and transcriptions into English was an exhaustive and lengthy process, although this process supported my familiarization with the data at all stages of the analytical process (Creswell, 2009). The translations were peer-reviewed by one native English speaker researcher not involved in my study, who made valuable comments on sentence coherence. This promoted objectivity and accuracy in the accounts presented because I had to convey the sense of interaction clearly.

Writing field notes was approached as a complementary strategy to differentiate important general and specific ideas in the interviews. For instance, field notes helped me to highlight some common areas of teachers' interest such as the relevance that they attach to MINEDUC support in their comments. Additionally, field notes highlighted core ideas regarding teachers' attitude to the online dimension of interviews; for example, I noted that some teachers were more relaxed when the camera was off in online interviews, and their comments were more personal and explanatory. May (1993) mentions that the notation or filing system must be aligned with the purpose of your research. In this regard, I used a pencil and a blank page divided into two sections: one with the heading *action/practice,* which documented ideas on what the teachers were doing in their classrooms, and a second one termed *reflection,* which included my perceptions and reactions to teachers' unexpected or unusual comments, key concepts, emotional remarks, or body movements. This strategy was useful for capturing how action was affecting the teachers' developmental attitudes, which I later inserted for realism into teachers' trajectories.

4.6 Validity and Trustworthiness in this study

McNiff and Whitehead (2006: 157) define validity as the establishment of "the truth value of your claims, its authenticity and trustworthiness", while Creswell and Miller (2000: 124) suggest that the choice of validity is guided by two perspectives: the lenses that the researchers adopt to validate their studies, which can be "personal, collaborative or with the support of externals", and the "researchers' post-positivist, constructivist or critical paradigms" (i.e. the articulation of philosophical and methodological decisions underpinning research). I approached validity from personal and constructivist perspectives. The former involved my *researcher reflexivity* and *values*, while the latter was informed by my socio-constructivist ontologies, where realities are constructed

(Lincoln and Guba, 2000), for example, through *the provision of detailed descriptions* for involving readers in the social situation.

Etherington (2006) clearly describes how reflexivity, i.e. "the capacity of researchers to acknowledge how their own experiences and contexts (…) inform the process of and outcomes of the study" (p.81), supports the validation of findings in research. Broadly, Etherington suggests positioning ourselves with our participants and the data in the interactions and relationships within the study for exploring the blurred areas of experiences. This enables us to distinctly understand what happens in research through our self-awareness, which in turn leads to "validation by readers", who are also informed about the position you adopt (p.82). For this purpose, I kept a reflective log during the whole research experience, a critical aspect for making sense of the continuum of my learning and for validating my claims of knowledge (McNiff, 2013). In early research stages (e.g. before the piloting) I used Gibb's (1998) reflective cycle framework to describe, evaluate and draw conclusions about my methodological decisions, including team arrangements or the pertinence of my methods of inquiry. I also used literature entries as emancipatory tools to question my professional beliefs, decisions, and actions, hence linking academic knowledge to the practicality of doing research. Appendix 9 includes a sample of my reflective log. In section 2.3.1.1 (p.43), I commented that doing action research involved satisfying your neglected values. Thus, satisfying my values of honesty to show the internal logic of my analysis and my methodological rigour adopted practical dimensions. To achieve this, I included detailed accounts of my analytical procedures with real pictures, drawings, and screenshots of my actions to show how my claims of knowledge originated.

The use of *rich* and *thick descriptions* reflects my constructivist intentions to validate my claims of knowledge in this study. Creswell and Miller (2000) suggest that descriptions create verisimilitude statements resonating with the readers' experiences and feelings. To do this, I described the implications and significance of certain events as they actually happened in the research process. For example, in sections 6.1 (p.171) & 6.3 (p.177), I introduced the professional development activities by describing the teachers and my actions along with the reasons behind those actions to involve readers' decision making about the pertinence of the activity's instructions or format, an action that embodies my socio-constructivist ontologies by allowing other people to

access teachers' professional development reality as well. However, it is important to highlight that data analysis and its presentation are interpretative and decision-making processes. Therefore, I made decisions and provided the "reader with a certain access to the situation being analysed" (Rasmussen 2005: 91); for example, through the accounts I selected to represent collaboration and reflection or through my choices to portray certain trajectories and not others. Here, other researchers could move in other directions by embracing different interpretations and choices with respect to the professional development experience.

Summary

In this chapter, I have presented a design framework to inform readers about my action research methodology and outline how a technology-enhanced action research professional development opportunity termed The Wiki Project supported both the professional development of my participants and acted as a tool for data collection. First and foremost, I have presented how the data was examined through interaction and thematic analysis. In the next two chapters, I present findings of The Wiki Project in terms of the technological mediation of professional development and collaboration in a wiki.

Chapter 5: Teachers' Professional Development Trajectories

Introduction

Chapter 5 is the first of two chapters reporting the findings of The Wiki Project. Based on a thematic analysis (Braun & Clarke, 2006) and an adapted interaction analysis (Jordan & Henderson, 1995), the data from face-to-face and online interviews, social & problem-solving wikis, and email exchanges (see figure 4.7, p.117) provided insights into the teachers' professional development process through a technology-enhanced action research approach. This chapter presents findings associated with the following research questions:

1 How does a technology-enhanced action research opportunity mediate the process of teachers' professional development?

3 How do teachers approach guidance, support and facilitation in the professional development experience?

Three teachers' professional development trajectories are presented in this chapter. These trajectories outline different developmental paths and show different episodes in teachers' professional development experience. Hence, describing various approaches to technology use, specific challenges and opportunities regarding its use, specific collaborative and reflective processes, the emergence of specific professional practices, roles, and different participation structures and relationships with me. In this last regard, these trajectories also provide insight into the evolution of my practices as a teacher educator and facilitator in relation to technology use for collaboration within the project. Each trajectory starts with an overview of teachers' research problem, the aims of their project, the time frame that they followed, pertinent information regarding their individual projects, and key information about what the specific trajectory represents. A visual representation of their project is also included to inform readers about our mode of communication, the main activities that teachers performed (see appendix 1), and my and the teacher's role in this process. These roles are important to have in mind as changes in roles define collaborative relationships (see section 3.3.3, p.81). At the end of each trajectory, I report the key findings derived from the teachers' and my experience. In section 5.4, a summary of key findings is presented. These three teachers were selected based on participatory and sequential criteria (Fulberg, 2016), as outlined in section 4.3.2.1 (p.117).

5.1 Camila's process to change her colleagues' attitudes towards technology use: Overview

Camila's action research project aimed at changing her colleagues' negative attitudes to technology use. She argued that her colleagues resisted using technologies for teaching and administrative tasks; therefore, teacher productivity issues emerged inside and outside the classroom. Camila, in her role as academic coordinator of her school's upper levels, set out to solve that situation. To do this, she worked from July 10th to December 28th, 2015. Camila's research work was mainly technology mediated. Figure 5.1 broadly details the steps that Camila went through in her mentoring project.

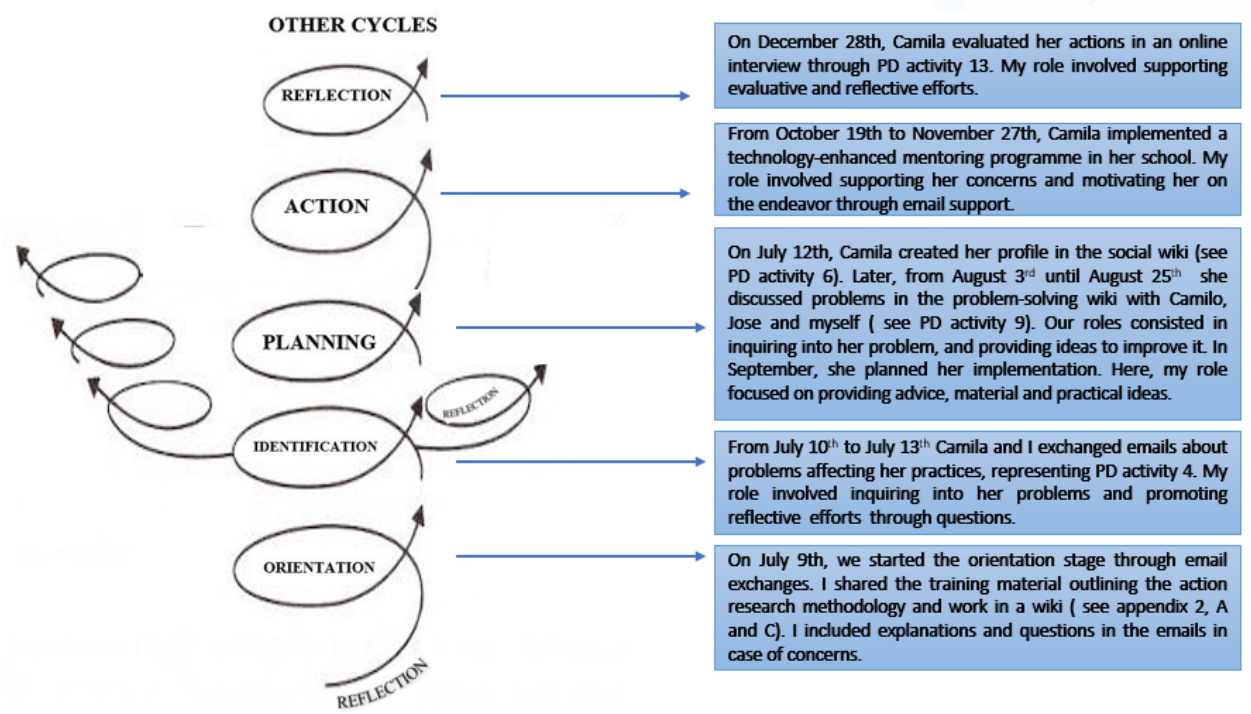


Figure 5. 1 Visual representation of Camila's action research process.

The following trajectory outlines the benefits and possibilities that technologies introduce in terms of remote communication and collaboration with others. Overall, it shows how technology mediates collaborative and reflective processes, professional development practices, and professional attitudes related to participation in The Wiki Project. In particular, this trajectory illustrates how distance is bridged through the pertinent use of technology in a professional development context, which enables me to access aspects of a teacher's professional development practice and engage in collaborative and collegial relationships to support her.

5.1.1 Camila's professional development trajectory

On July 6th, Camila showed an interest in participating in the study and informed me of her professional expertise by attaching her C.V:

> *"*Along with my greetings, please find attached my C.V., as I am interested in participating in your study" *[Cam-email-act 1-int]*

Camila's email extract 1, dated 06.07.2015 (13:32)

Her C.V. informed me about her expertise in research and education through varied training programmes, suggested her interest in the uses of technology for teaching and learning, and portrayed her as a teacher who had developed a professional trajectory in schools and higher education institutions over the years. I argue that, through her C.V., Camila introduced her professional profile and enabled me to trust her persona. Four days later, we started the orientation stage. This was conducted through email exchanges due to Camila's availability issues. In short, I sent three emails with information about the action research methodology and the wiki-based work with questions in case of concerns (see appendix 2, A and C). Camila replied formally with no concerns about the professional development material but informing me about a potential barrier to participate:

> *"*Thanks for the information (…) It is important to mention that I am on maternity leave until August 31st, therefore, I won't be in contact with the students until that date (…) I don't know if this is a problem, can you tell me?". *[Cam-email-act 1-chal]*

Camila's email extract 2, dated 10.07.2015 (17:02)

Camila's inquiry about potential barriers to participate evidenced her honest professional interest and attitude to engage in the study. In fact, we started the problem identification process through email exchanges on the same day. In total, we wrote four emails each, from July 10th to July 13th. Overall, our communication was fluid and I was able to inquire about the nature of her problems directly. Camila answered my questions pertinently, extensively, and formally, providing substantive insights into her problems and the actions taken to address them, while also sharing insights into the pertinence of emails as collaborative tools. All in all, her active attitude, the sharing of relevant information, and the use of emails as a communication channel boosted my understanding and engagement in her problem. At this point, her collaborative actions and reflective efforts started to become visible to me.

In one of these emails, Camila described two problems, both related to complications when trying to encourage teachers to use technologies such as Google Docs and a variety of software for teaching like Adobe Voice and RWT timeline. To explain her concerns, Camila situated her problem temporally and contextually, outlined the benefits and challenges of technology use, provided evidence, and invited me to ask her questions:

> "From 2010 to 2014, I worked as the head of the English department and we started using Google Docs for administrative work with the teachers. The advantages I could identify were:
> -Availability of information from any computer online
> -Enabling multiple people to edit documents on-line (…)
> -Collaboratively constructing a document, for example, for planning a single class
> -Using chat between the users who are online
> -Being able to share the document in private mode, for specific people (…)
> -Organizing folders in Google Drive cloud
> With the English department teachers, it has not been difficult to work with this technology, and the teachers use it without any problems, (…) in my role as coordinator, it has been difficult to extend the use of shared documents (…) most of my mature colleagues consider it difficult to use, and unsafe (…). I believe that the effective use of Google Docs in my institution can bring the following benefits:
> • Better time management for the teachers
> • Easier access to information when needed
> • More interaction and collaborative work when a document is constructed according to certain guidelines through chat.
> Please find attached some examples of what we are doing with Google Docs.
> Textbooks 2014
> Draft tests 2014
> Google Slides,
>
> http://fcampusano.blogspot.co.uk/2014/11/the-kite-runner-ppt.html
> **Ctrl+click to follow**
>
> This is what I can share for now, I remain attentive to your questions." *[Cam-email-act 4-ref]*

Camila's email extract 3, dated 10/07/2015 (21:07)

Camila's actions in this email promoted my engagement with her situation as she clarified some views on actions implemented and benefits/challenges identified; more importantly, she shared evidence with me showing her actions in a contextual and practical way through his students' work by including 3 hyperlinks. For me, her actions improved my understanding and enabled me to achieve a similar interpretation of the problem. In this regard, Camila's use of hyperlinks in emails increased my productivity because I did not need to download and open the documents one by one. I would suggest these actions were part of her guiding and facilitating professional practices to clarify my understanding in the best way possible, and also evidenced practical uses of email

technology for creating professional contexts and conveying meaning for collaborative purposes. In this email, she also called for verification of her ideas by inviting me to reply to her with engaging comments like "I remain attentive to your questions". This action hinted at her intention to work with me as a source of support for her problems, therefore clarifying my role in her endeavour and causing my professional role to focus on supporting her concerns. In this email, Camila also evaluated the impact that Google Docs had had on her institution over the past years by giving reasons (e.g. difficult to use and unsafe) behind the difficulties limiting teachers' use of shared documents. She also envisaged three benefits of an effective use of Google Docs. To do this, she drew on her past experiences and comments on time management, access, and collaboration, thus evidencing her reflective style to explain situations.

I replied to her email the next day, praising the material and asking if she had highlighted the positive value of technology in teachers as an approach to promote motivation. Camila replied pertinently on her next email:

> *"*It is good idea to appeal to the usefulness of technology for their teaching practices, however, we have done that several times in school meetings and various workshops (…) we have also included some articles in the school magazine about the role of technology in education, perhaps, this idea has not been explicit enough as negative attitudes still prevail (…). It is worrying to think about the time management and productivity possibilities they [the teachers] are missing which could give them more time to work in classes (…)" *[Cam-email-act 4-reflect]*

Camila's email extract 4, dated 11/07/2015 (15:37)

Camila's reply showed interesting aspects of reflection and collaboration. For example, it suggested that she evaluated her previous actions by acknowledging that the activities may have not been 'explicit enough' and problematized the situation referring to additional complications like time management and productivity in teachers' work. More importantly, her explanations about the usefulness of technology and her school's unsuccessful actions indicated that we shared a similar conception of the nature of her problem, which might be able to inform our future collaboration.

On July 12th, Camila created her profile to introduce herself to other participants in The Wiki Project (see appendix 1, PD activity 6). Here, Camila conveyed ideas about her professional expertise by mentioning her professional roles, qualifications, and professional interest in

technology-education, projecting an academic and professional image to the other teachers; moreover, she shared aspects of her practice and performed collaborative practices of guidance:

Excerpt 5.1: from the social wiki on 12.07.2015

> (…) I am an English teacher working in the Bristol School. In this school, I worked as coordinator of the English department, and since 2014 I worked as teacher and academic coordinator of the upper levels (…) I was fortunate to have pursued a Master's in applied linguistics in the Catholic University of Valparaiso between 2006 and 2009. This was an excellent experience, now I want to enrol in a PhD in linguistics, but I am unsure when (…) since 2010 I have developed my interest in the impact of technology on education, and I have worked actively in this aspect in my school. I invite you to visit the website of the English department, so you can get a glimpse of what we are doing www.bristolschool.cl, in the right sidebar you can access the digital classrooms that we have created with WordPress. (…).

Camila showed a positive attitude to collaboration by inviting teachers to visit her school's website at www.bristolschool.cl, so others could find out more about her professional teaching context and potentially inquire about her practices. She also included guiding comments to access the WordPress website by saying "in the right sidebar you can access the digital classrooms". This action evidenced practices aimed at guiding others, which I argue could support aspects of trust in online environments for teachers not familiar with WordPress. Camila's participation in social activities mainly involved introducing herself socially to others. I realized launching the problem-solving wiki one week after the social wiki could have prevented her from interacting socially with her team, as expanded in section 6.2 (p.173).

On August 3rd, Camila made her first contribution to the problem-solving wiki, where she discussed her problem with Carlo, José, and myself. Here, Camila adopted a leading attitude by sharing material, asking other people questions, and interacting directly with others, thus creating instances of collaboration through explanations aimed at providing support as expanded in section 6.3.1 (p.179). Overall, Camila used the wiki for two purposes. First, to reflect on the technology-education intersection; second, to support her colleagues' understanding by clarifying perspectives about technology use.

The following two excerpts illustrate Camila's reflective practice and collaborative actions of support in the wiki. Excerpt 5.2 presents Camila's ideas about mentoring. In this episode, Carlo proposed training teachers about the advantages of ICT methodologies, without specifying what kind of training could be used. This prompted my question to Carlo, followed by Camila's reflective ideas.

Excerpt 5.2: from the problem-solving wiki

1. **Miguel:** (…) What kind of training are you thinking about? (31.7.2015)
2. **Carlo:** it could be through mentoring. (…) more experienced teachers could train the less experienced ones
3. (…) (31.7.2015)
4. **Camila:** I completely agree with this kind of training as it allows teachers to share experiences and break
5. the barriers generated by external training. However, most schools' organization do not allow the
6. implementation of mentoring as it is difficult to coordinate teachers' schedules and organize activities where
7. teachers can gather and learn collaboratively. Based on my experience, it is difficult to get some colleagues
8. to open up to new forms of "doing", as in some cases, their level of metacognition is low, therefore, it is
9. difficult for them to analyse if what they have been doing for a long time can be improved (…) In this point,
10. I believe that the concepts of "vocation" is a critical concept. The low salaries of most teachers (and this is
11. an objective point) have generated levels of burden and resentment regarding new ways of doing (…)
12. especially the ones supported with ICT, which are not considered valid. It is necessary that we learn how to
13. access, process, and transform information through other means of communication, not necessarily
14. notebooks, books, and pencils. (…) (04.08.2015)

In this interaction, Camila reflected on the challenges of implementing a mentoring programme. To do this, she identified factors that hinder mentoring at school (5.2:6-7), drew on her experiences to illustrate teachers' low level of metacognition (5.2:7-9), introduced the concept of vocation to exemplify attitudinal challenges (5.2:10), linked the barriers she mentioned (e.g. low salaries, resentment) to ICT use (5.2:10-12), and finally shared her ideas on the changes that teachers needed to implement (lines 12 and 14). In this excerpt, Camila situated the discussion in a broader socio-cultural level to exemplify the challenges affecting the teaching profession in Chile.

Excerpt 5.3 shows Camila supporting José's views on the uses of firewalls. This excerpt also reaffirms how Camila approached the wiki as a space for reflection while expressing views on

technology and education. This excerpt starts with José answering my questions on how to raise awareness of students' Internet use.

Excerpt 5.3: from problem-solving

1. ***Jose:*** I think that creating awareness of Internet use it is a bit late, in a world where this tool gives you all
2. the freedom you want in one click. It is extremely shocking that a 15-year-old boy (…) can hire a hitman or
3. see raw videos that we just cannot imagine. (…) maybe, we can forbid some websites according to search
4. criteria (…) this can act as a parental control that some companies use to classify what children see on T.V.
5. (14.08.2015)
6. [*Later after my comments*]
7. ***Camila:*** Hello Miguel and José, the topic of teaching and learning about the uses of technology is
8. interesting. First, regarding José's ideas about "parental control", this is an element that already exists. The
9. firewall included in the computers allows us to filter advertising and adult content in websites. If this does
10. not exist, we will find lots of pornography and inadequate pages every time we search for a term on
11. Google. (…) MINEDUC has designed and shared a website with resources to educate teachers about this
12. topic. Let me share the link with you, so, you can see it secure internet. (…) There are aspects that inform
13. readers that children and teenagers are not controlling their online practices, however, we can't ignore this
14. situation and think about leaving this problem outside the classroom. (…) here, I provide some examples of
15. Internet use from a positive side:
16. •Interaction: through emails and WhatsApp, it is possible to communicate with people from all over the
17. world, at practically no cost. We can contact teachers, authors, specialists, students, friends, family, etc. All
18. this was limited before the Internet (…) (17.08.2015)

In this excerpt, Camila procedurally supported José's understanding of firewalls. To do this, she first defined firewall use and the implications of not using firewalls in practical terms, like for example, 'more pornography or inadequate pages every time we search for a term on Google' (5.3:10-11). She then shared a MINEDUC link with further information from where José could expand his understanding of the use of firewalls outside of the wiki discussion (5.3:12). Finally, Camila expressed her professional beliefs about the benefits of the Internet and its implications for professional development (5.3:12-14), before highlighting a number of positive uses of technology to support José's understanding about the benefits of technology (5.3:16-17). I argue that Camila's collaborative practices consist in explaining ideas with arguments and supporting resources to boost José's growth by increasing his knowledge about firewall use. In addition, this involved Camila sharing her understanding and making individual efforts to generate specific perspectives

regarding important aspects for both as professional teachers. Thus, embracing her role as a supporter of teachers' understanding in the wiki, and that our roles converged into learning from her perspective.

On August 25th, I sent Camila websites on Chilean research initiatives and a summary of the strategies discussed in the wiki. In this email, I inquired about and motivated her to apply one of the strategies discussed in the wiki. She replied the same night informing me of her decision to implement a mentoring programme. In this email, she also expressed her intention to share her research experience with others outside her school community, requested orientation on how to disseminate her research, and explained her future actions in practical terms regarding some technologies.

> "I visited the ICE website, this looks like a professional initiative (…) I would like to share our experience with the project. Do you think is possible? How?
> (…) the more concrete and realistic action that I could implement is a mentoring programme with the support of mentees in my school (…) with my English colleagues we organized ourselves to learn how to use the websites. Our objective now is to include the other departments. (…) what I need now is to figure out how the Moodle platform can support students' and teachers' learning and work in class. The main platforms we need to organize are:
> Moodle: for the submission and access of evaluations
> WordPress: digital classrooms to concretize the flipped classroom model and the organization of visual resources
> Turn it in: for the detection of plagiarism and personalized feedback
> Google Docs: where I considered your suggestions to inform the teachers in the mentoring programme of the benefits of Google Docs (...)" *[Cam-email-act 12-DM&int]*

Camila's email extract 5, dated 25.08.2015 (22:05)

Camila's actions illustrate her decision-making regarding her professional development, as she informed us of her intention to engage in professional relationships with other professionals. At the end of the email, Camila included a list of the actions she needed to accomplish regarding four platforms used for the mentoring programme. Importantly, in the Google Docs section, she acknowledged one of my suggestions about highlighting Google Docs' benefits for promoting confidence and engagement in teachers. Camila's action suggests two things: first, that, my role as a supporter of ideas and material, along with our exchange of ideas, have so far been relevant for her, given that she plans to apply my considerations practically in her implementation; second, that her comments evidenced trust and respect toward my professional ideas, therefore positioning our relationship in more collegial terms. This led my practice as facilitator to gain relevance for

the co-construction of joint perspectives through email. In addition, Camila expressed a need to learn to use the Moodle platform to assist students' and teachers' learning and work in class. The following day, I responded to this by sending her an article about the differences between Moodle and Edmodo[8] for social communication. This was the start of a series of coordinated activities to supporting aspects of her project which broadly consisted in her sharing ideas and reporting on her actions and my related contributions. That is to say, Camila's actions through emails defined our collaborative relationships and roles regarding her project, which helped our professional practices to become meaningful for us through the creation of a professional context to work in emails. For instance, On September 6th, and as part of Camila's planning, she held a meeting with the school authorities to present her mentoring proposal. That day, she reported the outcomes of her meeting to me:

> "These are some of the most important aspects we concluded;
> •Eight teachers will be selected as mentors [from the same school]
> •They will receive 20,000 CLP, so they can act as mentors of three teachers for 6 hours each
> •The mentoring will take place in October and December 2015, according to the teachers' timetables
> •I am now preparing the Moodle course, with 6 sessions (…)
> [Camila lists the features of the six sessions. These include: iPad, flipped classroom methodologies, podcasts, Turn it in, Moodle, Adobe Connect]
> Additionally, it will be possible to integrate the creation of a website in WordPress for those teachers who want a more attractive digital classroom, (…) I decided not to impose this point as there is a lot of resistance from some teachers (…)" *[Cam-email-act 12-Values&share]*

Camila's email extract 6, dated 06.09.2015 (22:35)

Camila's email enabled my role as supporter to strengthen affective dimensions by encouraging her to implement her ideas and praising her for her impact on her colleagues' professional development. This email also clarified some professional values related to the practice of professional development. For example, her respect for the teaching profession, manifested by her trust in her colleagues' capacities to train other teachers without relying on external support; her fairness toward their colleagues' work, shown by her efforts to compensate their work economically; her sense of justice, illustrated by the creation of a professional development opportunity with good standards that provides her colleagues with a professionalization opportunity; and her democratic perspective, reflected by her decision to give teachers the choice

8 Edmodo is an educational network similar to Moodle that aims to communicate teachers and students by enhancing features of social network.

to use WordPress or not. In this last regard, I consider that Camila also acted strategically to promote participation in the mentoring experience.

The mentoring programme took place from October 19th to November 27th. In total, 21 teachers received training. While setting up the Moodle training workshop, Camila worked in conjunction with the technical team that helped her set up the mentoring platform, which reflected her collaborative approach to improving the teaching practices of her colleagues. Camila did not participate as a mentor in the training workshop to avoid suspicions regarding payment, but was present as administrator. In that capacity, she observed the teachers' work for future evaluation in the reflective interview. She also motivated teachers' participation as part of the supportive role she adopted. Figure 5.2 shows a screenshot of the Moodle mentoring platform, specifically, the messages folder. This message shows Camila motivating her colleagues to collaborate, thus using technology to mediate the learning processes of others. The central message reads in English. *"Dear colleagues, don't forget to write your experience on the first tutorial in the wiki, for session 1. Thanks! It is also fundamental that you participate in the forums, so we can share our concerns to work collaboratively (...)"*.

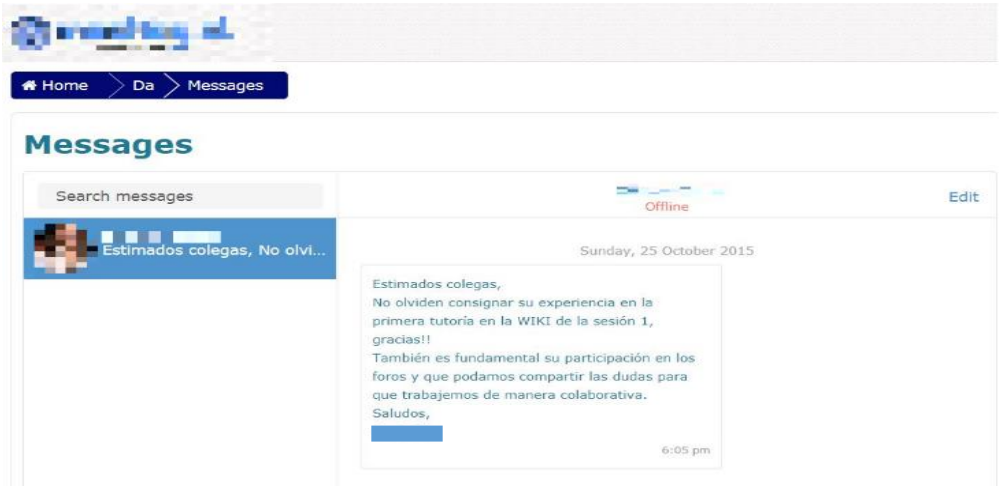


Figure 5. 2 Screenshot of the mentoring training message folder

Camila adopted a supportive role by encouraging participation through emotional mechanisms like referring to the fundamental role of others for learning. She also addressed teachers in a formal and collegial way to motivate participation and weave their actions into the collaborative goal.

On December 28th, Camila reflected on her experience through Skype. Our conversation lasted 40 minutes, during which Camila evaluated her research through professional development activity 13 (see appendix 1). Camila was on her last day of school work at the time of the interview. She sounded quite optimistic. Being in the teacher's room, she did not turn the camera on. This prevented a more affective engagement in the narrative activity, which instead became a question-and-answer activity where Camila expressed her reflexivity. As such, I inquired about the mentees' views on the mentoring experience. Camila recognized uncertainty among the teachers who did not enrol in the mentoring programme due to a lack of information:

> *"some of the teachers who did not participate had some questions: were they next? were they losing something? There was like a doubt at the end, I think I should have informed them about the initiative as well, there was a communication issue there" [Cam-OI1-act 13-reflect]*

In this short excerpt, Camila reflected on the mentoring implementation by saying "I think I should have informed them", concluding that there was a lack of "communication" with the non-participating teachers. Here, Camila drew conclusions based on her observations of the experience of others. I argue that this short example illustrates Camila's reflective approach during The Wiki Project, which involved, for example, understanding her action in relation to the experiences of others, providing evidence for her claims, acknowledging socio-cultural aspects for arguing her ideas, and linking situations with experiences. As, the interview progressed, Camila inquired about aspects of the theoretical framework and analysis in this study. The following interview extract exemplifies the former aspect:

> *"In the future, I'd like to be able to read the study, to get to know about the theoretical framework, the authors, from what perspective it was conducted (...) when I did a training course last year, I worked with teachers' motivation, but I don't know, is your theoretical framework in Spanish or English? It is in English, isn't it? because when I did my master's the bibliography was in Spanish, in general I am interested in European or American bibliography as there are more studies, and I would like to know." [Cam-OI1-act 13-reflect]*

In this interview extract, Camila satisfied her professional needs by inquiring about the theoretical framework of my study, thereby expanding her perspectives on new research approaches in contexts outside of Spanish-speaking countries. Through this action, Camila made use of my role to satisfy her academic needs. I think this is important to her future intentions to enrol in a PhD; therefore, I naturally adopted explanatory, clarifying, and descriptive attitudes to support her understanding.

5.1.2 Key findings from Camila's trajectory

Camila's trajectory showed that the technology-enhanced action research approach worked well to motivate her colleagues to become acquainted with the uses of technology by organizing and implementing a mentoring programme. The problem-, autonomy-, and experience-oriented features of the action research approach suited her professional needs and working style, so her professional decisions became achievable actions. Camila's successful experience was linked to her professional expertise, which included leadership abilities (e.g. proactivity, decision-making, organization), reflective practice, interests, technological skills, and her professional needs. These aspects energized her participation in the social practice of professional development, promoting her engagement in collaborative and reflective processes in online environments. First and foremost, her working conditions, such as her school's technological facilities, supportive authorities, and economic and human resources contributed to the success of her action research endeavour.

Technology mediated collaborative practices with others, including her colleagues, members of The Wiki Project, and me. Here, the use of emails and online interviews acted as a channel of fluid communication with me for sharing concerns, discuss interests, show aspects of her expertise and practice, and inform others about her context for our mutual engagement in her endeavour. In this regard, we engaged in collaborative processes to construct our understanding of her problem and then create collaborative ties of support dictated by the roles adopted in interaction, which I argued were defined by her collaborative attitudes towards me. More importantly, I noticed that the practical uses of emails (for information sharing, support, and collaboration) emerged gradually as a pertinent option for us to co-construct meaning regarding her concerns. Camila's interaction with other teachers in the wiki provided opportunities to express her reflexivity and engage in collegial relationships of support with José. More importantly, her attitude as a leader manifested itself in many ways: she shared material, expressed her ideas recurrently, and asked questions, all of which promoted collaboration and reflection. Camila's collaborative practices emerged while promoting participation in her mentoring intervention by advocating collegial aspects through respect and motivation with her colleagues, therefore building trust with them in online environments.

In a social domain, Camila conveyed an academic image in the social wiki, while showing collaborative traces supporting the construction of trust to collaborate. Camila worked directly with her team members, engaging in collaborative practices to build trust within her team. However, the launch of the problem-solving wiki one week after the social wiki could have been a reason for Camila's lack of social interaction with teachers as a group. This practical concern informs aspects of my practice as facilitator regarding my understanding of structural barriers for the emergence of collaborative practices (e.g. building trust) in the social wiki. As part of her participation in The Wiki Project, Camila expressed and put into practice professional values in both online and offline settings. Online, she displayed her qualities as a provider of support by helping the other teachers, including me, to make sense of pertinent aspects of the discussion; offline, her values became evident in the agreement that she negotiated in the school meeting.

5.2 Fernanda's process to satisfy her SEN/D students' needs: Overview

Fernanda's action research project focused on adapting the contents of the Chilean curriculum to the needs of her SEN/D primary classes. She reported not receiving support from her school and lacking expertise to do these adaptations, therefore, she struggled to manage her students and promote learning in the classroom. Fernanda worked on her project from July 17th until the last week of October 2015, although her research work was fragmented, due to an unsuccessful implementation. Fernanda's research work involved online and face-to-face components. Figure 5.3 illustrates the stages that Fernanda went through to solve her problem within an action research framework.

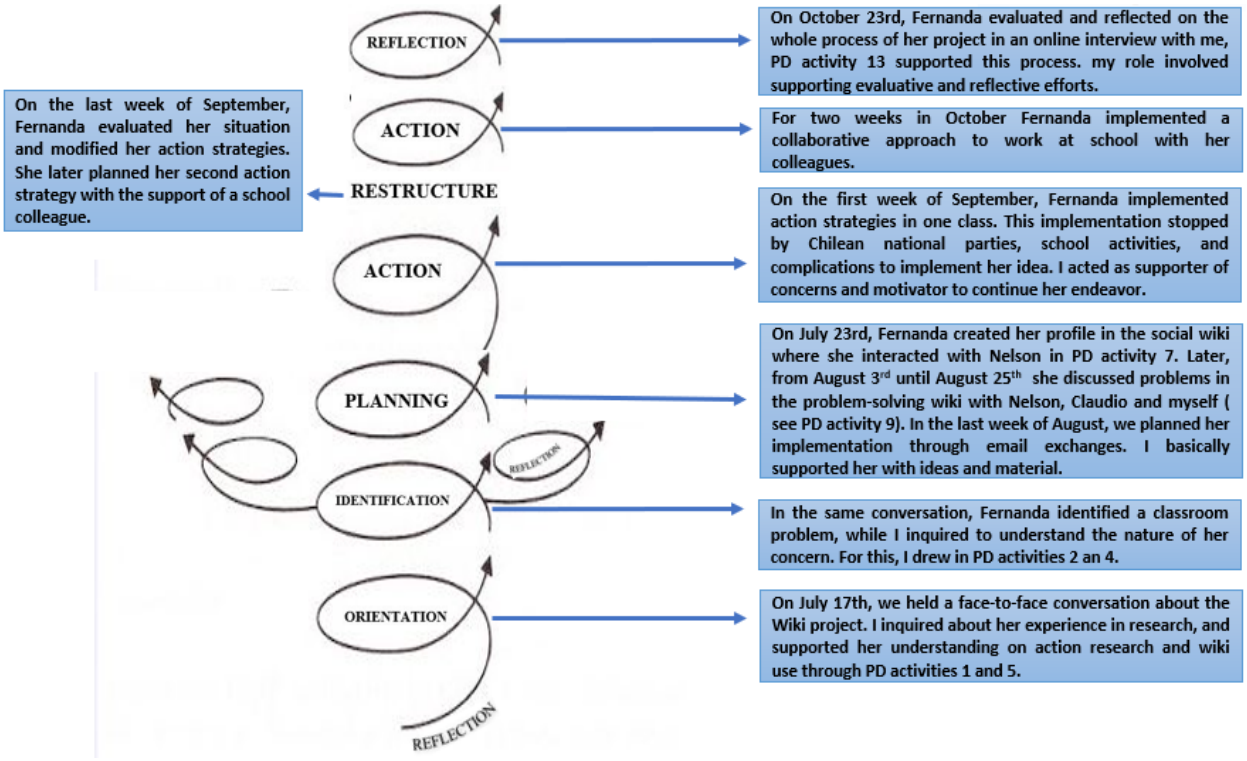


Figure 5. 3 Visual representation of Fernanda's action research process

This trajectory focuses on some of the complications that online professional development can cause teachers who, perhaps, need contextual support and more direct approaches to collaboration for supporting professional practices. It also shows the collaborative processes manifested in face-to-face domains through narrative activities. This trajectory specifically illustrates how physical distance, attitudinal dispositions, and fragmented participation promotes barriers affecting communicative and collaborative practices; however, it also shows how collegial relationships of support at the school level help teachers deal with problems of practice.

5.2.1 Fernanda's professional development trajectory

On July 17th, Fernanda and I held a conversation in a quiet café near her school, about The Wiki Project and action research. Fernanda seemed enthusiastic about conducting a small-scale study. She brought tests, looked attentive, and asked questions about her role in The Wiki project. Some of her comments showed her interest and needs in working with teachers from a different teaching context:

> *"(..) So, in each team there will be other teachers from different parts of Chile, and not only from Santiago (...) that sounds good to me as most of the time I don't have the time to meet teachers outside of my school…" [Fer-I1-act 1-int]*

She also explicitly introduced her needs about practical support and criticised her pre-service education, when I asked about her research experience:

> *"We only had a module at university before our dissertation (...). However, it [the module] was not very useful for me as it was mainly reading, reading, and more reading about research (...) it was not practical, and I am a practical person, I needed more practical support to approach my problems" [Fer-I1-act 1-need&critic]*

Fernanda's criticism illustrates how her past professional experiences neglected some of her practical needs for less theoretical approaches to education, hence evidencing the impact of the educational context on her perception of usefulness for her practices. As we continued with professional development activity 2 (See appendix 2, B), I asked Fernanda about her perceptions of some pictures. Here, she mentioned the need to work on collaboration inside her class while also sharing some features of her students:

> *"This photo portrays my classroom well [referring to photo 1]. I work with students with learning problems, therefore, my classroom needs to be well-organized to facilitate my teaching duties. The other photos do not represent me (...). Look! [pointing at photo 2] the way they are seated would not work in my classes. I understand this is an exam, but they are too far apart, I need the children ideally in groups (...). Photo 4 looks ideal, but it is far from my reality and the third (...) it is not my case as my children are more active (...)" [Fer-I1-act 2-need]*

Afterwards, I asked Fernanda to narrate a problem in her classes through professional activity 4. Overall, Fernanda described her problems and used the opportunity to comment on the lack of school support, reintroducing her need for orientation:

"What affected me the most is that in my school there are no curricular adaptations, therefore, any curricular adaptations that I make are dictated by my knowledge (…) there is no one who can suggest a pertinent or adapted activity for a SEN/D student. I simply do what I feel in the minute, there is no confirmation or evaluation about my performance as a teacher (…) I feel that in the school there is no need to plan, but I need to plan, I need guidelines (…) [here, Fernanda showed me tests and her students' work, with a focus on her task design]" [Fer-I1-act 2-need]

The fact that Fernanda showed me tests and her students' work supported collaborative process leading me to expand my views on her problems, address contextual issues, and embrace my supportive roles. At this point, I inquired about examples of students' actions in the classroom and her actions in response to them. These inquiries led Fernanda to tell me two anecdotes suggesting student behaviour issues in classes, such as hyperactivity and a lack of motivation:

"There is one kid who had a lack of emotional support (…), and the kid is all the time messing around in the classroom, he punches classmates, he moves all day, he says 'teacher, I don't know anything', (…) the only thing left for him to do is to take off his clothes to call my attention. When this happens, (…) I just use love and I say to him "Nick, I will write a negative note on the book". This situation is a bit frustrating as I feel I can do more for him…" [Fer-I1-act 4-value]

"Now, I am working with an autistic girl from the 6th grade, I started to work in an independent way with her, and she has felt more active (…) The headteacher told me "Fer, there is nothing else to do as her mom is really tired, her mom does not want any more war[9], she doesn't want to work with her in the house", so I motivate her in a different way, she has stickers just for her and she is happy (…)". [Fer-I1-act 4-value]

Broadly speaking, by sharing material and telling me about her experience, she gave me the possibility to build my understanding about the complex situation that she was going through, which involved a lack of school support and the diverse nature of her students' problems. However, I argue that these collaborative relationships mainly enriched my understanding of Fernanda's issues with little impact on collaborative activity between us at that time. I attribute this to the descriptive nature of Fernanda's accounts during the interview, preventing the joint construction of perspectives, and to the fact that our roles remained rigid as speaker and listener. Lastly, it must be noted that, as Fernanda mentioned her strategies to solve her problems, she expressed emotions

9 "I do not want any more war" is Chilean colloquialism meaning "I can't stand it anymore"

associated with those issues, evidencing professional values of support and democracy that encouraged her to satisfy the needs of specific students.

On July 23rd, Fernanda created her profile in the social wiki. Overall, Fernanda commented on personal and professional aspects of her life, her interest in professional development, technology and travel, and her intentions to study neurophysiology in 2016, thus conveying a less academic and a more personal image. In the profile, she directly addressed the value of collaboration for her by acknowledging the benefits of collaboration for effectiveness and the emancipation of perspectives. Also, she included emotional remarks about her way of working with students. She also made remarks on the challenges at her school, which I argue show her intention to engage others in her problem by externalizing a common teaching challenge in some school contexts in Chile: insufficient school support in teaching duties.

Excerpt 5.4: from the social wiki on 20.07.2015

> (…) I am working in a private school (…) with lots of students who have special educational needs. (…) working there has been a challenge for me, especially because I don't have any support from my school. However, working with children is completely rewarding in personal and professional terms. I work closely with my students, therefore, there is a supportive environment in my class to give them confidence and love (…) I consider this is a good opportunity to work collaboratively among teachers (…) this initiative can make our work more effective and we can expand our points of view about pedagogical problems that need a solution (…).

Days after her profile creation on July 28th, Fernanda replied to Nelson's comments on her profile. The interaction was brief, and mainly demonstrated Fernanda's friendly attitude towards Nelson, along with an intention to inquire about Nelson's interests by asking him questions (5.5:2). Such actions are meant to establish trust and acceptance with peers in the online setting:

Excerpt 5.5: from the social wiki

1. **Nelson**: Hello Fernanda! Another fan of videogames here. (…)
2. **Fernanda**: That is nice Nelson! In what website do you play? Do you have any good tips?

On August 10th, Fernanda added her first contribution to the problem-solving wiki as a response to Nelson's and my advice about working with SEN/D students. Fernanda's first contribution was brief and mainly reintroduced aspects of her problems to seek support, as Excerpt 6.6 (p.188) illustrates. Overall, Fernanda's participation in the problem-solving wiki was sporadic and

involved supporting her colleagues through direct advice without referencing other comments. She also re-introduced her problem in the wiki twice, all in all showing her necessity to find contributors who could give her orientation on what to do about her adverse situation. In relation to Nelson's and Claudio's role in the wiki, these teachers mainly provided direct advice without engaging in negotiation processes with Fernanda as reported in section 6.3.2 (p.187). I argue that this mode of communication in the wiki involved an emphasis in personal experience and individual effort, without acknowledging a collaborative situation in a more joint way between them and Fernanda.

On August 25, I sent Fernanda a summary of the strategies discussed in the wiki by email. Fernanda replied days later, sharing her plans of what she aimed to do and seeking my support in a direct way:

> "I will apply two strategies; first, I will seek psycho-pedagogical support, but in an independent way. I will find more information than I already have, and I will see if I can get something out of it (…) Additionally, it looks so interesting to work with the multiple intelligences approach. I do something similar with year 6 and 7, but not with lower grades as they aren't sure of what they want (anything and everything at the same time) (…) any ideas or material would be useful (…)" *[Fer-email-act 12-int&seeksup]*

Fernanda's email extract 1, dated 27.08.2015 (14:30)

Fernanda's email informed me of her actions and requested ideas and material for implementing a multiple-intelligence approach in her classes. This action evidenced her need of guidance for implementing changes and encouraged me to embrace my supportive and guiding roles. Thus, on August 30th, we started planning a multi-activity approach for students to perform several activities in class. In total, we exchanged 6 emails, three each in three days, where I supplied websites that discussed multiple intelligences, attached sample activities, and suggested ideas on what to do. In the first email, Fernanda described her teaching context, provided detailed information about the units that she would teach, commented on potential challenges, and requested support directly at the end of her email:

> "in year 2, I will start the unit "cool clothes", in year 4 and 5 "animal habitats", and in year 5 and 7 "wonders of the sea" [*Fernanda describes the unit contents*]. Honestly, it doesn't come to my mind how to implement all this, and in what grades to make the class more effective. We are also closing the term, and the week of national celebrations is coming soon (…) I had

in mind a fashion show for year 2, where some students could do the scenography, others could introduce some classmates, and others could present their favourite clothes (…)if you can give me some ideas or simply advise, it would be very useful".*[Fer-email-act 12-chal&seeksup]*

Fernanda's email extract 2, dated 31.08.2015 (19:20*)*

Fernanda's lesson descriptions helped me understand the contents that she wanted to include, while her request acted as a direct link from where I sent her ideas with different activities and lesson plan samples. In these emails, I inquired further about her ideas, the setting of the class, and the time and resources available, as a way of understanding aspects of her context better and thus provide pertinent support. Nonetheless, Fernanda's replies to my ideas and questions were not fertile for interaction, because she mainly thanked me for my contributions and informed me of their usefulness without creating further collaboration channels, hence limiting my involvement to providing material or just asking questions:

"Thanks for the lesson plans and the activities you sent to me. They are very useful for me". *[Fer-email-act 12-thanks]*

Fernanda's email extract 3, dated 3.09.2015 (08:20)

On September 7th, Fernanda emailed me to discuss some complications that she had encountered when implementing her strategy due to national celebrations and the range of extra-curricular activities that this involved. In brief, the situation made it hard for her to follow a path of implementation:

"Due to Independence Day celebrations, I won't be able to implement anything of what we had agreed, because I have lost several hours in the party preparations …unfortunately, these decisions are not my responsibility, as it is the school that promotes active participation. I am so sorry…"*[Fer-email-act 12-chal]*

Fernanda's email extract 4, dated 07.09.2015 (19:28)

Although I consider that these barriers are part of research processes in schools, perhaps clearer guidance in the wikis or more direct support to reflect on the forthcoming adverse scenario could have improved this implementation. I encouraged her and suggested her to resume her project after the holiday break. Fernanda took my recommendation into account and restructured her original plan, informing me of her decision to modify her action strategies to continue developing professionally and mentioning my influence in motivating her to improve.

On September 27th, and after resuming her implementation, Fernanda emailed me informing on her new idea and requesting more contextual support:

> (…) I have decided to approach my problems from a different perspective, so instead of working with the students I will work with the teachers (…) I talked with one colleague, and she suggested that I collaborate with other colleagues at school to start seeing what they do, how they control the students, satisfy their needs, etc…"*[Fer-email-act 12-intent&Rsup]*

Fernanda's email extract 5, dated 27.09.2015 (17:23)

Email communication became sporadic at this point. Fernanda did not reply to my emails for over two weeks, which might have been due to her busy life as a teacher or perhaps a result of her attitude to replying my emails. Nonetheless, on October 16th she emailed me about her second implementation, confirming that she has been introducing new actions and was willing to proceed to the second interview. I noticed features of her independence as a teacher in her response and also realized that she needed more contextual support, since I and the other The Wiki Project participants were unable to meet her needs regarding certain issues. Below, extracts from the second interview on October 23rd reconstruct aspects of her planning and implementation processes.

From September 28th to October 16th, Fernanda planned and implemented a collaborative intervention to work with teachers at her school. Fernanda planned this with the support of a primary school colleague, called Maria, who oriented her regarding how to approach teachers and organize the overall intervention. Maria suggested ideas on what to do –which Fernanda acknowledged prescriptively– and gave her practical support regarding the adaptation of her schedule:

> *"in a sense she [Maria] suggested ideas on how to approach the mature teachers (…) they tend to be self-centred. Maria told me that formality was important as teachers may feel that it is a real issue, something more professional, and she also helped me to organize my timetable to see windows [meaning gaps available] where I could visit some classes (…) she suggested I visit ideally two classes" [Fer-OI1-act 13-Rsup]*

Fernanda did not draw on theoretical foundations to design her plan but drew on Maria's expertise to gain insights into class management. Maria's gave her practical ideas to solve the problem in her class, whose practical relevance Fernanda commented on.

> *"We discussed the best sitting arrangements for my class, I used to sit my students in groups, that was one of the reasons of the noise and active behaviour. (…) Maria suggested me to try a U shape to start with, and to pay attention to the other teachers sitting arrangements (…)*

the U shape was quite effective because I could see all the students, so I could teach in a better way and keep them under control which is what I really need…" [Fer-OI1-act 13-Rsup]

From October 5th to the 16th, Fernanda implemented her second intervention. This involved adopting a formal attitude to work with teachers, observing their classes and engaging in collaborative activities with them:

"it was mainly working with the headteachers (…) in a formal way to create a closer relationship with them. It worked excellently in year 2 and 5, where I observed their classes, (…) supported them [the teachers] in some activities. (…) with the year four teacher we shared material and she gave me feedback to solve problems she spotted in some activities (…) we also talked during breaks". [Fer-OI1-act 13-Rsup]

Fernanda modified her attitudes to approach others more formally, made use of her spare time to support others and receive support, and got closer to her colleagues by observing what they did in classes, in a sense becoming an apprentice to boost her development. I argue that the relationships with her colleagues where the turning point in Fernanda's professional development, since they changed her attitudes to working with them. The implementation had a positive impact for her, as also mentioned in the second interview.

Fernanda's interview took place late at night for her (at 22:00 PM) and for me (at 2:00 AM). She did not turn her camera on, and she sounded a little tired after a long day's work. All in all, I noticed a less inviting context for engagement in reflective and narrative interaction. Regardless, in this adverse scenario, Fernanda self-evaluated her actions and drew conclusions to identify aspects of improvement after my questions:

"I mainly approached the headteachers to be able to work together, and I found that despite the limitations I acted well, I possibly didn't make any substantial changes inside the classroom, but I generated closer links with the teachers, who are very important for me now, as I have learnt to solve problems from other perspectives, not as a novice teacher… I don't know" [Fer-OI1-act 13-reflect]

Fernanda also self-evaluated her actions positively by connecting her performance to her professional development; furthermore, she made sense of broader challenges in her practices after describing 7th and 6th graders' performance based on her experience:

"I learnt to systematize work in the classroom. I feel that I used to try to teach the classes perfectly, and tried to find external stimuli, but sometimes, when you have basic things like emotional deficits, you struggle with discipline. I still have a conflict to solve, as I believe now that the lack of discipline is related to the school and that it is what prevents me from making

good classes(...) I say that, mainly regarding the year 7 and 6 students (...) I realized that if you try to solve the problem but do not have the support from the top, it is difficult to improve your teaching, as behaviour is not a problem of a class, it is a general aspect and that is not addressed by the authorities". [Fer-OI1-act 13-reflect]

This evaluative intent came after establishing relationships between the school authorities' role and facts in the classroom, to later conclude that the solution would involve broader changes like involvement from school authorities.

5.2.2 Key findings from Fernanda's trajectory

The technology-enhanced action research approach did not satisfy Fernanda's needs to find a solution to the issues of her SEN/D classes. The autonomous focus and online working modality did not suit her needs of guided orientation, direction, collaboration with others, and contextual support. Here, Fernanda's collaborative arrangement with one colleague at school, who supported her directly with contextual advice and practical ideas, evidenced that.

Contextual constraints (e.g. school holidays, extra-curricular activities) fragmented Fernanda's implementation and online communication with me. In addition, her attitudes to online communication (e.g. late, short, and descriptive replies to my inquiring emails) prevented a more fruitful use of the technology-enhanced professional development opportunity. This attitudinal barrier led to my facilitator practices being limited to asking questions or sharing material, hence preventing our practices from evolving into co-construction. Despite this, Fernanda's participation in The Wiki Project, along with her interaction with me and others, influenced her attitudes to taking professional decisions and changed her ways of doing collaborative work in her school. Fernanda viewed my role and the role of teachers as a source of direct support. She displayed this approach by repeatedly introducing her problems in the wiki, discussing her problems of practice in interviews, and directly requesting support from me in emails. Fernanda's past learning experiences at university triggered some negative attitudes to theoretical professional development approaches, with the emergence of practical challenges inside the classroom perhaps stressing those negative views. Interestingly, Fernanda externalized ideas about the importance of collaboration in her profile, nonetheless, but this did not necessarily translate into collaborative practices or a more active participation in the problem-solving wiki. In this regard, her

relationships with Nelson and Claudio in the wiki caused collaborative practices to remain at the advice-giving level, hence hindering collaborative activity.

In this context, the technology-enhanced action research approach mediated the expression of her needs during her participation in The Wiki Project, encouraging our collaborative relationships to adopt supportive and guiding dimensions and not constructive ones. Technology also mediated her reflective processes within the natural course of research. Here, Fernanda's reflections manifested themselves through the evaluation and description of her practices in the reflective interview, where I asked her about her actions. Finally, technology mediated the expression of her professional values regarding the social practice of teaching and influenced her approaches to collaboration in a wiki, resulting in direct advice with a focus on individual performance; nevertheless, no coordination with others or explicit references to them emerged. For further details, see section 6.3.2 (p.187).

5.3 Danitza's process to motivate students in science classes: Overview

Danitza's action research project focused on motivating her year 5 classes to engage in the contents of the science curriculum. She argued that the contents of the curriculum were too complex for her students' understanding, therefore, they needed to be adapted. The problem emerged after these adaptations, as students seemed to lose interest in her classes. To address this situation, Danitza worked from July 18th to October 25th, 2015. Danitza's research work involved face-to-face and online components. Figure 5.4 outlines the stages that Danitza went through to solve her problem.

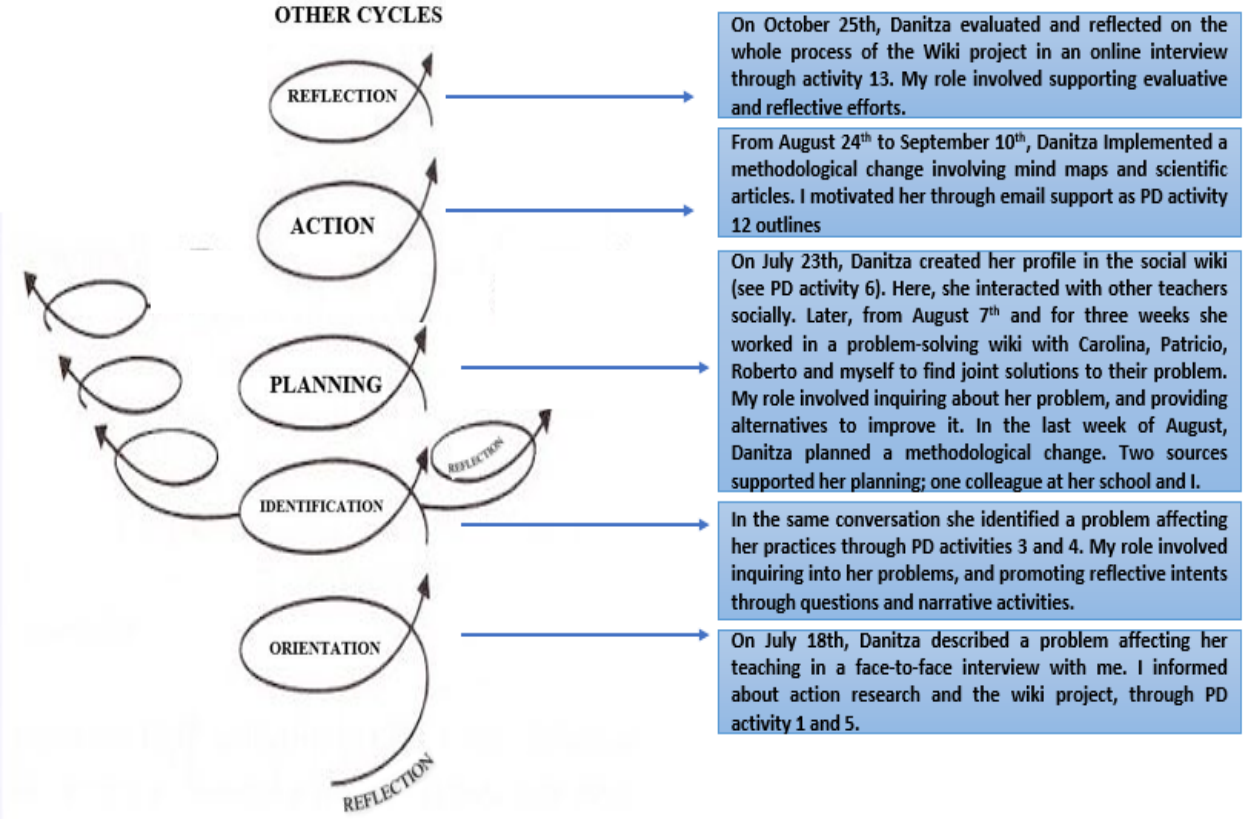


Figure 5. 4 Visual representation of Danitza's action research process

This trajectory centres on the possibilities that technologies provide in mediating professional development processes of collaboration with an emphasis in collegial manifestations in online environments. In addition, it shows how narrative components enable trust building through affective engagement, although with complications when it comes to online settings. More importantly, this trajectory illustrates how technologies mediate reflective processes through professional development activities and the importance of collaboration in that regard.

5.3.1 Danitza's professional development trajectory

On July 18th, Danitza and I held an interview in a café in downtown Rancagua. The café setting was suitable for narrative activities, thanks to its quiet atmosphere and comfortable sitting arrangement. She was approachable and friendly while I provided information about The Wiki Project and inquired about her research experience (see appendix 1, PD activity 1). At the beginning of our conversation, she adopted a receptive attitude to my comments, asking no questions regarding her participation in the project and expressing no concerns about the working modality. This created a subtle barrier in my communicative intentions, which broke after I directly asked her about her participation in professional development. At this point, Danitza commented on her lack of training and mentioned what she had done to remedy the situation:

> *"as the government is not giving teachers any training, the Physics teacher and I have been training ourselves and searching for training opportunities. A few months ago, we went to a scientific inquiry workshop delivered by Explora[10]. It was a free workshop, where we were oriented on how to conduct scientific research, I mean with hypotheses and control groups (...)" [Dan-I1-act 1-critic]*

Danitza's experience with research was relatively recent, on-site, and had a quantitative focus; nonetheless, it apparently did not satisfy her needs, as mentioned when I asked her to give me more details about the workshop:

> *"The workshop had a focus on secondary education, so for the lower levels of year three, four and five, which are the levels I teach, I didn't get lots of perspectives. However, it helped me to review contents science teaching, scientific research, and genetics (...)" [Dan-I1-act 1-need]*

As we moved to professional development activity 2, I invited Danitza to create a metaphor for education:

> *"I see education as a forest, where each individual tree gives different fruits, not only apples or oranges but all kinds of fruits (...) the fruits are the different students with their own interests, hopes, likes, personalities, good things, and bad things (...), I am one of the trees that holds those fruits, and release them when they are ready to face the world" [Dan-I1-act 3-emo&values]*

Through her account, Danitza showed aspects of her vocation by describing the positive image of education as something organic that grows over the years. In addition, she clearly expressed her

10 Explora is a branch of CONICYT (National Commission for Scientific and Technological Research) that supports scientific and technological culture, promoting critical thinking and curiosity among teachers and students.

professional values of support and guidance toward her students, along with her positioning inside the classroom as the orchestrator of learning. I argue that her emotional remarks emerged through our engagement in emotional terms through the narrative aspects of the activity and that this generated the level of trust and openness that she needed to share her thoughts. As we proceeded, we engaged in a conversation about a problem in her practices. I inquired about her problem and Danitza shared some views about the challenges of articulating classroom contents with students' interest:

> *"it is mainly related to the pedagogical area. 5th and 6th grade contents are too complex, so I must adjust them. They used to be part of secondary education, and now I must articulate them for the kids to understand them. So, in this articulation, I feel that some students lose interest in the topics. This is because [the topics] are abstract and the kids are more concrete. So, I use drawings, diagrams and I take them to the lab, so they can observe and manipulate the contents I am covering, (…) so they can learn" [Dan-I1-act 4-pp]*

After her account, I inquired about the relevance of a change in her situation. Here, Camila elaborated on how a change would have not only practical relevance for her classes, but also a more transformative impact on her:

> *"Overall, I want them to change their attitude to learning, they seem not to understand and get confused with my explanations. This is really worrying, because SIMCE is coming soon, and I want them to succeed. But more importantly, I feel the need to be more fun, practical, and entertaining with these new generations. They are demanding, eager to learn and I feel we as teachers need to adapt to these new changes [Dan-I1-act 4-pp&reflect]*

All in all, through our conversation we agreed on the pertinence of a practical change that suited her classes and her students' interests and needs (and her own) while remaining feasible.

On July 23rd, Danitza, created her profile to introduce herself to the other teachers as excerpt 5.6 shows. Similarly, like most teachers, Danitza used this opportunity to reveal her intention to connect with potential collaborators by informing how essential others are for her development. She also described actions related to the practice of teaching and related them to her democratic values (i.e. her actions for making contents accessible to students). All of these choices gave her profile a more personal and friendly tone.

Excerpt 5. 6: from the social wiki on 23.07.2015

> (…) I love teaching and I like to amaze kids with science, making science accessible to them through games and practical activities. I want students to develop scientific skills to construct new knowledge, but more importantly, I value enriching my pedagogical practices with the help of other colleagues, as this is essential for our performance as teachers.

Danitza's social and emotionally engaging approach to interaction became more evident in the "Hello Group" task, where Danitza adopted an active social role by greeting 5 teachers and engaging in three social exchanges about her hometown, underprivileged students, and science labs (see Excerpt 6.1 p.176). This hinted at her mechanisms for establishing relationships with other teachers outside the teaching dimension in the social wiki, or –as I argue– in more personal terms.

On August 7th, Danitza added her first comment to the problem-solving wiki, where she interacted primarily with Roberto and myself. Danitza's participation in the wiki focused on supporting the team with advice and solutions to solve their problems. To do this, she added motivational comments with encouragement and empathic remarks toward others' problematic situations. Overall, Danitza's wiki contributions were well-structured and explanatory as expanded in chapter 6 (see section 6.3.3, p.192). Excerpt 5.7 illustrates her emotional mechanism for supporting Roberto. This excerpt shows Roberto suggesting strategies to enhance scientific skills and Danitza replying to him. This episode of interaction emerged after I asked the team some questions, as presented in Excerpt 6.10:1 (p.196).

Excerpt 5. 7: from the problem-solving wiki

> **Roberto**: This is something that all students face today because they are immersed in social media and they lose the point of relevant aspects. This has been problematic for me as well. (…) it occurs to me that every class starts with a motivational activity related to sciences (…) there are plenty of news about therapeutic abortion, global warming, (…) things that the students listen to daily, but they have not stopped to reflect (…) (08.08.2015)
>
> **Danitza:** Hello Roberto! Certainly, the motivation at the start of a class is essential for the kids to focus and pay attention. It is an excellent idea to analyse curious facts in sciences and ask them [*the students*] to give their opinion (…). However, (…) scientific skills are very difficult to put into practice, especially since the curriculum prescribes how you should act. (…) (11.08.2015)

In this excerpt, Roberto suggests solutions to motivate students to engage in science activities by commenting on the use of additional material for that purpose (5.7:3-5). Danitza replies by naming Roberto and including emotional remarks such as "Certainly" (5.7:6) and "it is an excellent idea" (5.7:7) before introducing her opinion on the challenges that Roberto's idea poses in lines 8 and 9. I argue that Danitza introduces a degree of collegiality in her comments by supporting Roberto's idea before introducing her stand.

From August 24th to September 10th, Danitza planned and implemented a methodological change consisting in the use of mind maps and scientific articles in one year 5 class. In this regard, I noted that Patricio's contributions could have been an inspiration for her (e.g. 6.10: 6), as he exemplified ideas on how to use mind maps, learning logs, and scientific articles in classes and described clear steps to follow when implementing changes. These comments could have resonated with Danitza's own models of teaching and affected her choice of strategies.

Danitza planned her implementation to avoid clashes with national celebrations. Overall, two sources supported her planning process. First, email support with me, where I shared scientific articles and websites to work with mind maps. Here, Danitza expressed her appreciation of the usefulness of that material, showing collaborative traces such as thanking me for my assistance and creating interactions around the material shared by commenting on how interesting and useful it is for her teaching:

> "Thanks for the links Miguel! I wasn't aware the "Muy interesante" magazine had a free section with articles. I have always liked that magazine as it explores aspects of scientific interest, which are comprehensible for kids…" *[Dan-email-act 12-thanks]*

Danitza's email extract 1, dated 24.08.2015 (19:32)

However, I also noticed that her responses to my support offers and inquiring comments were quite positive and her decisions were already clear, as she did not outline any complications which could be used to establish a closer support and guidance relationship with me. This suggested that my support and guidance were less necessary or less pertinent at that time, perhaps for due to the distance between us or as a result of her intention to make her own choices.

"The ecology unit fits the mind-maps activity quite well. I have set aside the last 15 minutes of the class for the crafting of mind maps around the concepts of the human body. That unit includes aspects related to smoking and its prevention, so it fits well. (…) in one-hour classes, we will work with scientific articles that I took from last year's textbook…"*[Dan-email-act 12-DM]*

Danitza's email extract 2, dated 27.08.2015 (18:02)

Second, regarding school support, a language colleague explained the crafting of mind maps as Danitza commented during the second interview online:

> *"the language teacher explained to me how to create mind maps, there were things that I didn't consider such as the connection of the main idea with the class objectives, the importance of using colours to help students understand and adding shapes for alternative ideas (...) She also visited my class and explained mind maps to the class [5th graders] (...)" [Dan-OI1-act 13-Rsup]*

Danitza's comments suggest that she identified her professional weaknesses regarding mind maps and found ways to remedy those deficits, hence, she established networking relationships for supporting her project with teachers from her own school. Danitza also made sense of methodological aspects of mind maps, such as use of colours and shapes, from her colleague's knowledge, demonstrating that the main methodological approaches for implementation came from others who were more aware of her context, had similar needs, or could provide face-to-face support that our distance prevented.

Danitza's intervention took place over the first two weeks of September. During that time, Danitza replied to my question about the most significant aspect that she identified at this stage (see appendix 1, PD activity 8), showing an open attitude to share her experience; more importantly, she was willing to monitor her performance and reflect on how changes influenced students' understanding. In total, she sent two emails to report and reflect on her actions:

"reading the ideas of others in the wiki meant giving a new meaning to my classes, which now are more interactive and fun. For instance, at this moment, we are reading simple scientific articles related to the topics we are covering, we analyse them, answer questions, and finish with a brief conversation about their ideas. The children are also doing conceptual maps to summarize what they have learnt, the idea here is to start simple to bring learning closer to the children (…). In general, this has worked well, the children are motivated as the articles are simple and I use lots of colour and funny shapes in the mind maps. (…) I liked that the ideas were feasible to apply, so I am really motivated to continue to see the outcomes in the students." *[Dan-email-act 8-share&ref]*

Danitza's email extract 3, dated 03.09.2015 (16:04)

Broadly speaking, Danitza reflected on how the ideas of others affected her attitudes to be more interactive and fun to motivate her students; then, she described her and her students' actions in relation to the ideas presented in the wiki. Danitza was the only teacher who shared her reflections, evidencing her positive attitude to sharing her thoughts with me.

On Sunday 25th October, we held a Skype conversation. In our interview, Danitza evaluated her actions in The Wiki Project through professional development activity 14 (see appendix 1 and 2 B), although we were interrupted by Victor's (Danitza's son) tantrums, which forced Danitza to shorten her answers to my questions about the narrative activity. This generated a relatively difficult scenario for communicating with her. I argue that this event encouraged me to adapt to the adverse circumstances by using a more transmissive question-answer approach instead of asking emancipatory questions. Danitza commented on the challenges she faced and examined her actions to draw conclusions:

> *"what was difficult was creating questions about the text, what I wanted to achieve with the scientific articles, if I wanted only reading comprehension, maybe I wanted them [students] to infer what the hypothesis was or take ideas out of the text and relate them to an experiment, things like that. It was difficult to create questions about the text, I did not have a clear goal I think" [Dan-OI1-act 13-chal&reflect]*

In this excerpt, Danitza evaluated her performance based on her realization that she had designed questions without a clear goal. As the interview continued, Danitza evaluated the impact of her colleagues' ideas on her. When I asked her about the factors that had affected her professional innovations the most, she said:

> *"[Danitza, referring to Patricio's comments on learning logs] (...) the teacher asked the children to create a log of the learning achieved in the class, if they had doubts, new ideas, discoveries, etc. So, I found that valid to do, as it changed the way you are teaching in essence, to change traditional approaches and break the schemes the kids are used to in the classroom" [Dan-OI1-act 13-Rsup&reflect]*

In this excerpt, Danitza implicitly identified the value of a collaborator for her development, a comment that also emerged in her closing remarks:

> *"I had an idealistic view of classroom innovations, not in practice though, but in the way, I tried to do things in the classroom (...). In that sense, the real experience of the teachers helped me, the fact that they had already implemented strategies [referring to portfolios, articles, mind maps], made me think, well! if that worked for them, it can work for me as well" [Dan-OI1-act 13-reflect]*

All in all, Danitza's professional change would have been difficult without the support of others either with ideas or actions. Nonetheless, the support was reciprocal and emerged after her active, friendly, and supportive attitude during the project.

5.3.2 Key findings from Danitza's trajectory

The Wiki Project worked well for Danitza's intentions to adapt the curricular context to her students' needs. Especially, the autonomy-oriented features of the design helped her to follow her path of development at her own pace, avoiding contextual barriers (e.g. school holidays) and adopting contextual strategies such as working with a school colleague for a more effective implementation of mind maps. The narrative component in the face-to-face professional development activities provided good grounds for her to express her professional values, needs, and emotions regarding the teaching profession. Here, the suitable environment supported her engagement in more emotional and personal terms, although some natural challenges (e.g. interruptions) emerged in online interactions which I argued could be prevented but not foreseen. Most importantly, findings showed that sharing reflections with others requires a degree of emotional engagement; in this regard, the narrative component may have prompted Danitza to share her thoughts with me.

Collegial relations of support were important for Danitza's development. Maybe, this highlights a need for more direct support than the online dimension allowed at that time, or it is simply a sign of the resource-rich practice of professional development that invites us to construct understanding together with those in our closest context. In this regard, Danitza's approached collaboration in the wiki from a more emotional perspective. For instance, by providing motivational comments, praising contributions, and giving advice to support Roberto, she embraced collegial aspects in her efforts to help others. Danitza approached my role as a source of support to share her reflections and receive material for her implementation. Here, email supported collaborative practices of sharing and aid, although the joint construction of perspectives online between us remained limited, maybe because Danitza did not need my support at that time. Regarding my professional practices, they evolved through our engagement in more emotional terms (e.g. sharing reflections, more personal communication in emails, thanking each other for our contributions, manifesting needs),

which fostered co-constructive perspectives between us. However, adverse contextual situations while using technology (e.g. interview interruptions) encouraged me to adopt a less collaborative and more transmissive approach in interviews when asking questions.

As such, technology mediated collaborative relationships with others in the social and problem-solving wiki. Here, Danitza adopted a social and supportive role by giving advice and emotional support to Roberto, thus displaying more collegial dimensions of collaboration. Furthermore, Danitza engaged in collegial relationships at school to support her project. Finally, her reflective comments were mediated through technology in wikis and supported by thinking questions that she shared with me.

5.4 Summary

This chapter presented three professional development trajectories with a focus on collaboration and reflection while also discussing aspects of the social practice of professional development in online environments. I also presented some offline considerations involving collegiality at school, contextual impact, narrative aspects, and the emergence of values through teachers' actions: In addition, I shared some insights into how my practice evolved while working with the participating teachers.

Technology mediated teachers' professional development differently, with more success in some cases than in others. Here, contextual aspects, attitudinal dispositions, and personal interest in technology use affected teachers' relations with technology for their professional development. Collaboration adopted different dimensions in the trajectories with a focus on collegial aspects of support, sharing, aid, and trust in teacher-teacher interactions in the wiki, as well as in emails and online conversations with me. It also adopted constructive dimensions in interactions with me in face-to-face conversations for the mutual understanding of the problem, and through email exchanges with one teacher, where we engaged in collaborative processes leading to mutual engagement to support aspects of implementation.

Technology mediated teachers' reflective practice through email exchanges, wiki contributions, and online interviews differently as well. Mainly, personal features led to the selection of critical or descriptive reflexive approaches through teachers' participation. In this domain, teachers' reflective practices in the online interviews addressed the importance of others for their development, hence showing inter-personal collaboration and reflection in practical terms. The reflective and the narrative components included in the face-to-face professional development activities encouraged teachers to discuss emotions and professional values in more personal terms. Here, contextual conditions in both online and offline settings supported or hindered communicative opportunities for the expression of emotions and professional values, as well as reflection.

Findings show that teachers approached support, guidance, and facilitation in different ways, on a regular basis, and in accordance with their individual professional and academic needs. Therefore, our collaborative relationships were distinctive, although collegial elements such as sharing, telling, assistance and trust emerged as the primary approaches to collaboration between us. Collaboration and collegial relationships outside The Wiki Project were an important part of teachers' planning and implementation processes to fulfil their professional needs. This shows the impact of the context and the importance of collegial aspects for this group of teachers. Throughout this chapter, it also became evident that the expression and implementation of professional values emerged naturally from the social practice of doing research. Values emerged in the articulation of professional needs with actions in their adjustments for change. Finally, my professional practice as a teacher educator and facilitator in relation to technology use and collaboration evolved through the uses of email technology as a pertinent collaborative tool for distance support, information exchange, guidance, and collaboration. In addition, our engagement in more emotional terms in narrative and reflective activities, the emergence of contextual barriers for co-construction (e.g. school holidays, interruptions), and my awareness of teachers' negative attitudes to collaboration in online environments (e.g. short replies to emails or no replies) triggered changes in my understanding and practices. This meant that I took notice and acted strategically when barriers emerged (e.g. adopting a more receptive stance in online conversations) or examined in more detail the possibilities/challenges of the context (e.g. support from others, use of resources, pertinent times) for the co-construction of meaning.

Chapter 6: Collaboration and Collaborative Practices in Teams

Introduction

Chapter 6 reports findings about the teachers' professional development with a focus on their collaborative activity in a wiki. This chapter has two sections. Section one reports teachers' collaborative practices for building trust after all eleven of them created individual profiles and interacted socially. Section two focuses on the negotiation and division of labour displayed in collaborative practices after the teachers were grouped in three teams (see section 4.2.4, p.112) and invited to solve school-related problems in a wiki. Each section starts with an explanation on how the activity was introduced along with the teachers' general actions in that regard, and at the end of each teams' collaborative activity I present my findings. Findings about our relationships and insights into the evolution of my facilitator practices are reported as part of the collaborative activity. Specifically, these insights are included in the last episode of the methodology team's collaborative activity. This chapter finishes with a summary of my key findings in section 6.4 (p.199). This chapter presents answers to the following research questions:

2. How do collaboration and collaborative practices manifest through the process of professional development of teachers working in a wiki?
3. How do teachers approach support, guidance, and facilitation in the professional development experience?

6.1 Social wiki: Overview

The social wiki was implemented systematically in two stages. I first emailed each teacher a link to access the social wiki gradually after our individual interviews in the first weeks of July. By clicking on the link, teachers accessed the social wiki and created a profile. Figure 6.1 below shows a screenshot of the introductory page. A message in green welcomed teachers to the project, thanked them for their participation, and succinctly defined what to do: 'create a profile with professional and personal information'. In addition, the participants were informed that one of the aims of the activity was getting to know each other, that personalizing communication was valuable, and that the wiki was a space for companionship until the end of the project. My profile

presentation followed as a prompt in blue. Here, I highlighted my professional features as a school English teacher. I described my teaching interests, experience in schools, and the university that I graduated from, along with exemplifying a teaching experience involving technology in the classroom and outlining my positive emotions toward collaborating with them. These actions strengthened engagement by representing affective dimensions and professional similarities as I described in section 4.1.5 (p.97).

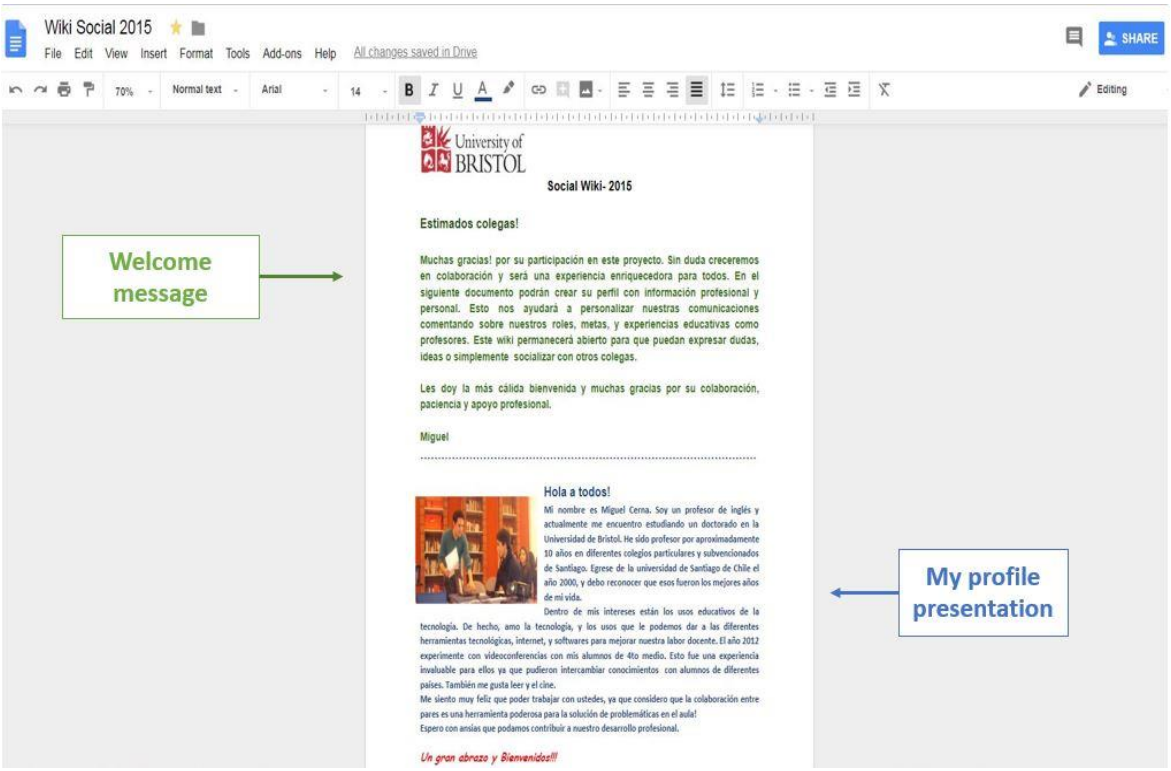


Figure 6. 1 Social wiki introductory page

Teachers added their profiles at their own pace: while some created theirs just after the interview, others took several days, so I sent those teachers kind reminders about the importance of introducing themselves to the other participants for the upcoming collaborative work. By July 17th, 2015 all teachers had added their profiles with pictures except for Patricio, who reported feeling uncomfortable adding a picture, which illustrates his attitude to having an online social presence.

The second stage started on July 20th, when I sent a group email inviting the teachers to get to know one another by asking questions or simply commenting on others' profiles (see appendix 1, PD activity 4). Thus, we shifted from a one-to-one communication mode with me to a collective one. The social wiki was the first opportunity for the teachers to interact before collaborative work

started. Figure 6.2 below shows a profile sample and the mode and space for socialization. The access toolbar on top illustrates the editing tools available for adjusting font size and colour and inserting links or pictures, among other features. Teachers inserted a photo of themselves and wrote their profiles under their pictures using editing tools.

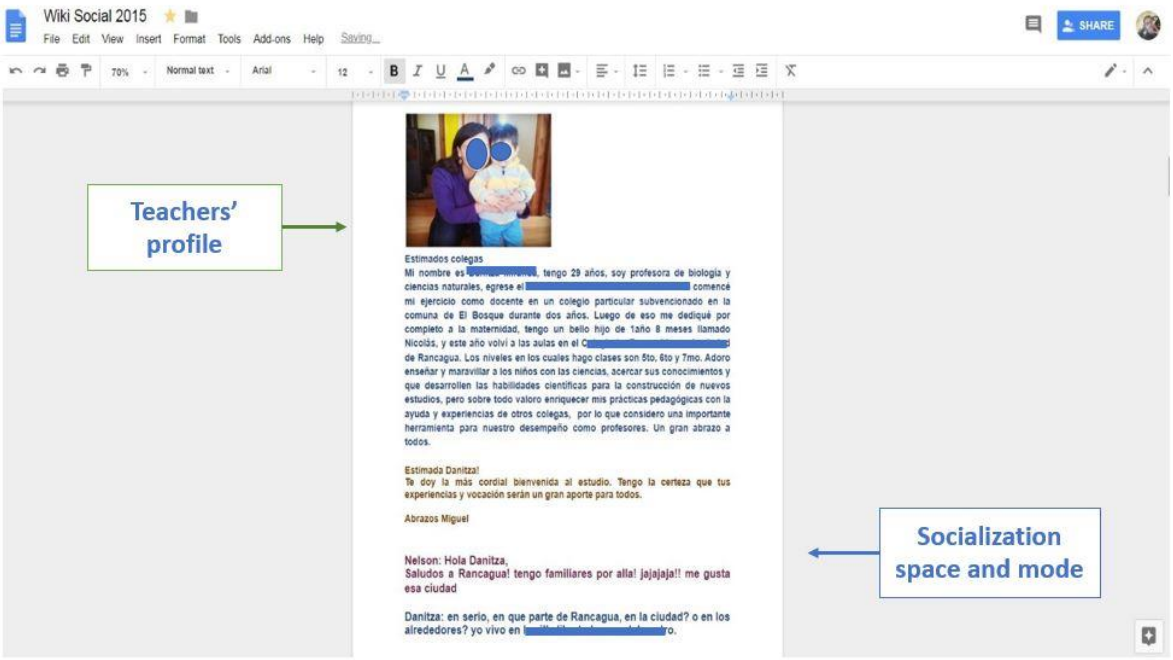


Figure 6. 2 Sample of a teacher profile and mode of socialization

Teachers interacted in the blank space under the profile information. Most of them used the font colour and size options to differentiate their comments, although I edited some contributions for clarity and order. I also welcomed all teachers under their profiles, but I did not interact further to avoid initiating interaction, and hence promoting social processes in them. Broadly speaking, interactions were few, concise, did not extend over time, and revolved around topics not limited to the teaching profession.

6.2 Building trust

The analysis of the teachers' actions while introducing themselves in the profiles evidenced their feelings and hopes regarding collaboration, describing them in emotional terms and showing their positive attitude to working with others, thus suggesting being at ease when sharing their thoughts with colleagues:

Claudio**:** "*I am anxious to start interacting with colleagues from different realities and working contexts, and to try to fix the world of education*". *(Cla-SW-act 6-emo)*

Carlo: "*it is a pleasure to work with all of you, and eventually find solutions about our problems*" *(Carlo-SW-act 6-emo*)

Roberto: *"I hope we can get to know each other more and strengthen ties, building fruitful relationships for our professional development". (Rob-SW-Act 6-emo)*

Roberto also stated that his participation was focused on satisfying professional needs to open up to dialogue for knowledge emancipation:

Roberto: *"I am also interested in participating in this project, because I am always looking for professional development opportunities. Last year, I became the coordinator of the municipal teachers' network, therefore all new ideas are of value for me" (Rob-SW-act 6-interest)*

Carolina and Camila directly addressed the importance of collaboration in their profiles, acknowledging benefits such as professionalization and knowledge building:

Carolina*: "it is extremely important to exchange ideas/opinions/resources because that way we can advance as professional teachers". (Car-SW-act 6-interest)*

Camila: *"I do believe that collaborative work is necessary and important for knowledge development" (Cam-SW-act 6-interest)*

More importantly, when José referred to the aim that he sought to achieve by participating, he acknowledged the role of other teachers within the project:

Jose: *"I am certain that working with you will be beneficial for coping with the attitudinal and behavioural challenges I face daily in my classes". (Jose-SW-act 6-goal)*

Camila shared her school website in her profile along with an open invitation to visit it and instructions on how to access it (see Excerpt 5.1), while Carlo shared his personal website by adding hyperlinks, and extended an invitation to know more about him:

Carlo*: "if you want more information about me, you can visit my website." (Carlo-SW-act 6-share)*

These actions showed the participants' intentions to be asked about their educational contexts and themselves, along with illustrating how websites open spaces for showing additional professional features. There were common actions worth commenting. For example, eight teachers portrayed themselves smiling in their profile photos, projecting an open and warm image to the others.

Camila and Nadia's picture were with students around reinforcing their status as school teachers. Seven teachers opened or closed the profile with group greetings, conveying a positive message of respect and politeness:

***Danitza**: "Dear colleagues" (Dan-SW-act 6-Ggreet)*

***Carolina**: "Hello everyone" (Car-SW-act 6-Ggreet)*

***Jose**: "Regards to all" (Jose-SW-act 6-Ggreet)*

Broadly speaking, all teachers alternated professional and personal information in their profiles. However, Camila, Claudio, and Patricio's profiles had an academic focus, emphasizing their qualifications, academic goals, and working trajectory:

> ***Claudio**: "I have worked in several subsidized schools, and since 2010 I also work as teacher of ethics in the evening in a professional institute in Concepción. I have an acceptable level of English (pending certification). In 2008 I did a M.Ed. in philosophy at the University of Concepción, and last year I finished a M.Ed. in educational management" (Cla-SW-act 6-qual)*

> ***Patricio**: "among my postgraduate qualifications I have a diploma in molecular biology and biotechnology (...) among my academic goals I plan to apply to a PhD in biomedical sciences, although I am unsure if in Chile or abroad" (Pat-SW-act 6-qual)*

The remaining teachers included academic information as well, nonetheless, the overall tone of their profiles was more personal and rather informal, including comments on hobbies, likes, and personal interests:

> ***Nadia**: "I am a full-time foodie, I love going out with my dogs, I am an amateur dancer and Internet addict" (Nad-SW-act6-hob)*

> ***Nelson**: "I love reading, riding a bike, playing the guitar, and visiting museums; in fact, I am planning a trip to the El Prado national museum this summer, if everything goes well" (Nel-SW-act 6-hob)*

Additionally, Danitza shared information about her family:

> **Danitza**: "*I have a beautiful son called Victor, who is now a year and 8 months old*" *(Dan-SW-act 6-fam)*

The academic or personal profile style was common to both experienced and novice teachers, hence I attribute profile orientations to personal writing styles rather than to expertise. I argue that

alternating information about academic histories, specific hobbies, families, or certain qualification could reflect teachers' sense of collegiality and trust between themselves by opening up various features of their lives inside and outside school to allow others to identify with significant aspects.

The interactions in the *Hello group* professional development activity were few and concise. Nelson engaged in two brief exchanges: one with Fernanda to make references to videogames and another with Danitza about the city of Rancagua in Chile. Danitza greeted three teachers, generating one episode of interaction with Patricio around science labs (see excerpt 6.1, below). Claudio greeted Nadia and made comments on her profile and about his intention to complete the MINEDUC portfolio, but without receiving an answer from her. He also greeted Roberto from Concepcion to bond over their shared hometown. Roberto greeted Nadia and commented on how useful it would be for her to complete the AEP portfolio, but received no reply. Carolina, José, and Camila started adding contributions in the problem-solving wiki directly.

I analysed the participants' interactions considering practices other than greetings. From this perspective, the fact that Nelson asked Fernanda some questions (see excerpt 5.5, p. 154) and commented on Danitza's profile hinted at his intention to express commonalties by making references to hobbies and places of residence, while Danitza's actions revealed a similar intention and more in social interactions.

Excerpt 6.1: from the social wiki

1. **Danitza**: Hello Colleague! What an interesting profile, I am looking forward to sharing my views with you
2. and learning from your experience in the classroom. I am a primary science teacher, I have a small lab, but
3. it is an achievement. (23.06.2015)
4. **Patricio**: Thanks, Danitza! In fact, we are from the same area, long live the natural sciences! My
5. lab is not a wonder, but I make the most of it. (24.06.2015)
6. **Danitza**: ha ha! yes, I do the same. (24.06.2015)

In this brief interaction, Danitza and Patricio socialize about school resources. We see Danitza greeting Patricio in collegial terms (6.1:1), praising him about his profile, expressing positive feelings about their future interaction in line 2, and making direct references to their teaching

subject and school resources (6.1:3). Danitza makes implicit references –by addressing the other teachers as "colleague" (due to their shared subject area)– as well as direct references, mentioning her profession and school resources, discussing how she externalized practices, and directing significant comments to Patricio to create trust and ease interaction. This encouraged Patricio to add further information about the qualities of his science lab (6.1:4-5). I argue that teachers reading others' profiles and commenting on them in a friendly, relaxed, and deferential tone supported trust in others before interacting in the problem-solving wiki. The small number of interactions in the social wiki could be attributed to the launching of the problem-solving wiki on July 27th, which could have diverted the attention to their respective teams. Nonetheless, being busy or having a negative attitude to the mode of interaction presented could also be reasons for the few exchanges observed.

6.3 Problem-solving wiki overview

I launched the problem-solving wiki on July 27th, 2015 for three weeks originally, although I extended its use for another week to promote more interactions in the teams. I first grouped the teachers into three teams (see section 4.2.4, p.112) and sent them a link with the let's work together professional development activity (see appendix 1, activity 9). Figure 6.3 shows a screenshot of how the activity was introduced in the behaviour team.

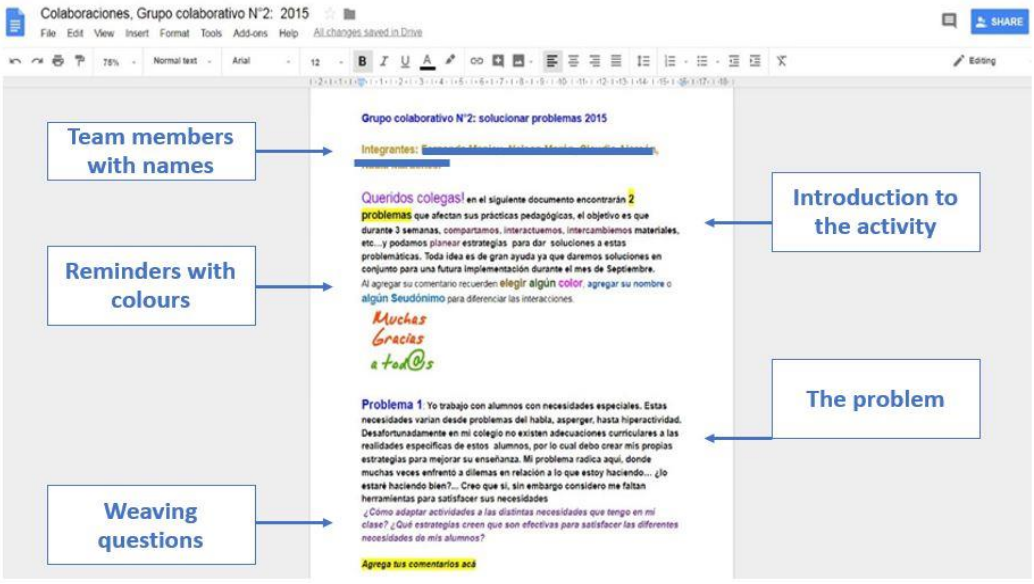


Figure 6. 3 Problem-solving wiki introduction

In the headings, the team number (at that time) and teachers' names were included for the participants' reference. The introduction to the activity included a greeting saying 'Dear Colleagues!', outlining the activity objective and time scope as 'the objective is that during the next 3 weeks, we share ideas, interact, share material, and create strategies to give a solution to the problems presented'. These actions explicitly indicated the problem-solving goal and the activities to perform. A short message followed, which said 'all your ideas are important because we will give solutions for a future implementation in September'. This stressed the significance of interacting and sought to engage teachers to work toward a common purpose within a clear time frame. For clarity, I reminded them to use pseudonyms and colours to differentiate contributions. Here, I exemplified the use of colours by colouring words, a strategy signposting key information as well. A square picture thanking all participants that read 'thanks to @ll' ended the introductory paragraph. I introduced the activity as a problem-solving situation with blue headings and numbers reading Problem 1, Problem 2, etc. I added a short first-person description of a problem, including emotional remarks, details of the situation, information about the context, and actions already carried out. These practices encouraged an accurate and real perception of the problem for empathy and commitment. Finally, one or two question(s) in purple weaved the dilemmas into the specific problem(s) of the teachers. Team 1 and 3 discussed three problems, while team 2 discussed two. I merged some teachers' problems into one because they encompassed a similar classroom concern, although the questions outlined the divide with a specific focus on individual problems. I also anonymized the problems to enable teachers to comment without being in the spotlight and to embrace communal engagement; however, in their interactions, Fernanda and Roberto, revealed their identities by adding extra information about their problems and introducing new needs. I suggest these teachers needed to convey their problems clearly. Figure 6.4. below shows how teachers commented on the wiki. The first lines in yellow read add your comments here, so teachers followed the instructions presented in Figure 6.3.

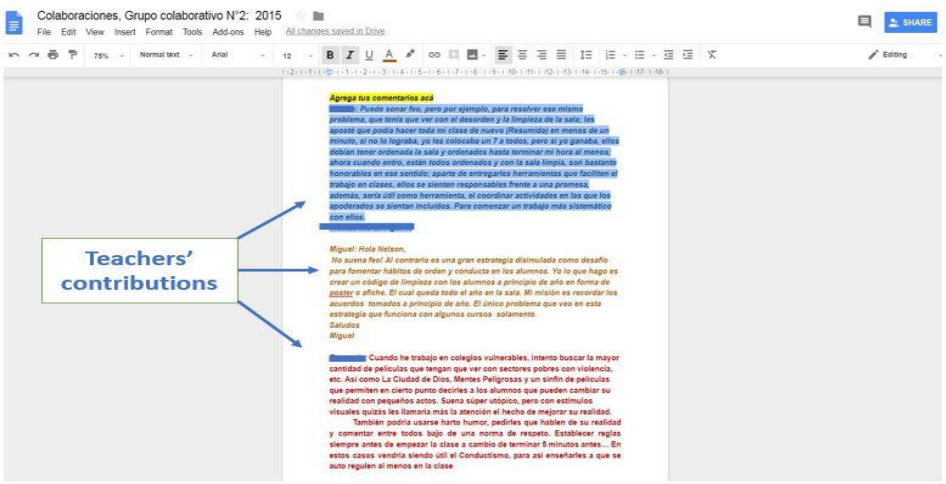


Figure 6. 4 Teachers' contributions in the wiki

Teachers' contributions varied in length across teams. There were contributions spanning over one A4 page, 3-line expressions of thanks, and standard contributions as in Figure 6. 4, averaging 150 words. I visited the wikis twice a day to ensure contributions and questions were addressed, and to promote participation. My intention was not to start contributions in order to avoid presenting my own interests. However, I did this in the behaviour and methodology teams to speed the starting of discussions. I also sent four weekly reminders that included professional development information for the teachers (e.g. seminar, scholarships, educational websites, news) to support their problems and enhance participation in an indirect way. I contributed 23 times in the technology team, 7 times in the behaviour team, and 13 times in the methodology team, which illustrates the teams' different interactive practices and my involvement in facilitating teachers' performance while interacting.

6.3.1 Collaboration and collaborative practices: Technology team

Camila, Carlo, and José formed this team. Overall, teachers' participation peaked in the first two weeks and faded at the beginning of week three with two exchanges between Camila and myself. Camila contributed 15 times, José 11 times, and Carlo 7 times, which added up to 22 letter-size pages of contributions. Teachers commented on three problems (see section 4.2.4, p.112).

José and Camila adopted an explanatory and referential style of writing that manifested itself in long paragraphs that included explanations of ideas, comments about education, classroom

experiences, and methodological tips. They mentioned each other repeatedly and made references to past teaching experiences, students, parents, colleagues, and MINEDUC. Carlos' contributions were also explanatory and referential; however, his participation was sporadic and his comments shorter. Excerpt 6.2 below exemplifies how Camila and José went about contributing to problem 1. In their first posts, teachers mainly added ideas without referencing others directly but greeting the team and commenting on the problem. This episode occurred in the second week of discussion when teachers started to mention other colleagues more directly; therefore, negotiation practices became more evident. Below, I show how an explanatory and referential style writing style enhanced collaborative negotiation practices. This episode came after my questions about strategies used to improve the students' negative attitudes in some classes, triggering an episode of interaction between Camila, José, and myself.

Excerpt 6.2: from problem-solving wiki

1. **Jose**: (…) it is important to mention that curricular regulations in schools are oriented to the development
2. of skills, however, when we address aspects related to the use of ICT inside the schools, the problems increase
3. due to the growth of the Internet (…) and the irresponsible use of it (...). So, Camila is right to recognize
4. students' lack of habits, which are essential to work with students and are based in the pedagogy of
5. accompaniment, which Camila mentioned in the point of (students) not tolerating advice or getting frustrating
6. easily (…) regarding Miguel's questions… I personally based my classes on the pedagogy of accompaniment
7. (…). A second strategy I use (…) is to show students short films (…) (03.08.2015)
8. **Camila**: Thanks José for your reflection. I find the idea of short films interesting (…). In my case, I apply
9. different strategies depending on students' attitudes, for example:
10. - fights between classmates or mistreatment: I stop the class and address the problem (…). (07.08.2015)
11. **Miguel:** I always remember a music teacher who told me, "when students fight for the first time, you must
12. stop the class immediately and make a big show (…) call the headmaster, parents, head teacher so students
13. realize that NO aggressions are allowed" (08.08.2015)
14. **Camila:** that is true that students seem to be conditioned to react to big shows (…) and if you call the
15. authorities the problem is not invisible. This has happened to me twice: once in my first year of teaching,
16. the students (…) changed my chair for a broken one (…) when I sat the chair broke and I fell. The laughter
17. was generalized! The next day, the mother of the kid sent me a box of chocolate and an apology card made
18. by herself, other mature colleagues regarded this as unacceptable as it could have been more serious (…).
19. (15.08.2015)

In this excerpt, we see how a referential and explanatory writing style triggers collaborative negotiation practices in a wiki. José started with his ideas about the challenge the Internet poses regarding students' habits, explicitly referring to Camila's previous ideas on that issue in lines 3 and 5. He also introduces the idea of the 'pedagogy of accompaniment' , linking this idea to Camila's previous comments on tolerance and frustration (6.2:5-6). He finally addressed my question by naming me and describing two strategies: the pedagogy of accompaniment and the use of short films (6.2:6-7). José brought Camila into the discussion twice and addressed my question directly, which shows how references give dynamism to the discussion and, more importantly, help create explicit joint references to continue the thread of the discussion. In this context, Camila continued the interaction by thanking and praising José's ideas (6.2:8), adopting respectful and approving attitudes towards his comments. She continued adding strategies and examples to help other participants cope with students' negative attitudes (6.2:10). These were indirect references that illustrated what she does in class. After my anecdotal comment regarding fights in the classroom, Camila agreed with my anecdote (6.2:14) and then shared a detailed personal account about a negative school experience (6.2:15-18). By doing this, Camila's mechanisms for joint reference adopted an emotional dimension; i.e. she externalized a negative teaching anecdote, highlighting similarities between our experiences that enabled us to empathize with her.

The sharing of resources through hyperlinks mediated collaborative processes by supporting the expression of ideas in a practical way (e.g. by adding contextual or personal information) and informing teachers about educational resources they may not be aware of. These aspects provide evidence for the mediating role of tools for emancipating perspectives in online environments. Table 6.1. outlines the number of resources shared by the teachers through hyperlinks.

	Photos	Books	MINEDUC documents	Videos	Educational websites
Camila	1	1	4	1	7
Carlo	0	0	0	0	0
Jose	0	1	0	0	0

Table 6. 1 Material shared in the technology team

Camila shared 4 MINEDUC documents about good teaching and ICT, a book about ICT, one video of her school, and a photo displaying the dimensions of ICT, along with 7 websites including 6 free online courses and a link to her school magazine. All this illustrates the mechanisms that she used to support her colleagues and promote interactions for emancipating

perspectives. Carlo did not share any material, while José shared a book about methodology. Excerpt 6.3 below shows how Camila's sharing resources through hyperlinks promotes the negotiation of ideas. This episode occurred after José's first contribution in problem one, when he argued that the curriculum needed to adapt to students' needs and should not dictate teachers' actions prescriptively.

Excerpt 6.3: from problem-solving wiki

1. **Camila:** I believe that to face a group of students in our national reality, we need to study the contextual
2. elements that guide our curriculum. From that perspective, we need to consider the following documents:
3. Curricular framework
4. Educational standards
5. Framework for good teaching
6. Matrix of ICT skills
7. we must understand that our students are in an evolving process of change, as they live in a world that is
8. mediated by technology, where the concepts of time and space have changed. It is not possible to expect
9. our students to respond to behaviourist practices which could have worked 30 years ago (…) (03.08.2015)
10. **Miguel:** (…) thanks for the Matrix of ICT skills and the other documents. They make sense regarding the
11. criteria of progression from elementary to secondary education (…) (04.08.2015)
12. **Carlo:** your comment considers the problem in a holistic way (…) in other words, the strategies
13. that work for one institution do not necessarily work for another, (…) the topic itself is complex as if we
14. consider the factors involved in the problems, we first need to identify them to later generate methodologies
15. (…) to face the problem. However, what Camila mentioned about understanding the context in detail and
16. Jose's comments about considering students' needs is right, since they are based on a global view, and at the
17. same time generate strategies to face the problem (…). (04.08.2015)

This excerpt illustrates how hyperlinks supported negotiation of ideas. Camila advocated for the importance of the curriculum to understand students' reality by sharing the four MINEDUC axes (6.3:1-6) and then wrote about the evolution of education due to the impact of technology (6.3:7-9). I thanked Camila for the documents and noted how they support the scope of progression from elementary to secondary education (6.3:10-11), creating references to the material provided. Carlo mentioned the complexity of the problem and brought back José and Camila's contributions to unify perspectives (6.3:15-16). I argue that Camila's use of resources illustrates two aspects: first, how mediational means supported her standpoint by informing the rest of us about the reality of ICT in Chile without the need to saturate the wiki with extended explanations affecting negotiation

processes; second, how these resources act as a frame of reference and boost understanding by expanding my perspectives and those of Carlo while diversifying our collaborative roles (i.e. I understood the curriculum-ICT framework relationship more clearly after reading the documents and Camila's ideas, and Carlo unified perspectives for potential consensus between Camila and José). Nonetheless, these consensuses did not happen in the wiki because most threads of discussion faded naturally over the course of the discussions.

Sharing teaching experiences, views, and reflections about education and sharing resources were among the participants' mechanisms to contribute in the wiki. Excerpt 6.4 below explores how these actions triggered negotiation practices. This episode emerged after Carlo and myself had commented on the potential of ICT mentoring to change teachers' negative attitudes to technology. Camila agreed with our claims and argued that the teachers' low salaries, lack of technological skills, and time constraints generate demotivation and apathy regarding new ways of teaching, especially those involving ICT in classes. This episode starts with Jose's claims about the role of the technology – education intersection in Chile.

Excerpt 6.4: from problem-solving wiki

1. **José**: (…) there are some teachers who only use social media like Facebook to share material or information,
2. but working with tools or programmes that require more complexity makes them apathetic. (…) For this
3. reason, technology must be a complement [*to education*] … but platforms that are more complex for teachers
4. lead to tiredness, because they need to learn how to use them. More than teachers' training (on technology
5. use), we need to teach that education is complementary to technology, because today we have enough
6. students connected all day long in front of a screen, what we need is more markers, blackboards, and field
7. trips and less videos, audios, and images. (03.08.2015)
8. **Camila:** Thanks José, However, it is very difficult to separate oneself from technology nowadays. The
9. incorporation of ICT in education is not an option but a series of skills that define a 21st century citizen. In
10. the problem 1, I included a link of the matrix of ICT skills from MINEDUC. (…) MINEDUC has developed
11. several versions of this matrix for students, teachers, and stakeholders. The four dimensions of this matrix
12. are: Information, (…) We generally move in the first level (…). Nonetheless, the acquisition of ICT
13. crosses all processes of teaching and learning. There is a long way to go because teachers lack knowledge
14. and understanding about ICT use, and students are totally embedded in social networks and fun, but
15. there is little in terms of ICT for learning. What would happen if teachers don't do anything about it? Can

16. we advance, or can technology become an obstacle because we don't know how to approach it? This is
17. something that worries me a lot, because teachers are not aware of the real contribution of ICT to education
18. and they are closing themselves to a whole universe of democratic resources (…)

19. José, what you are mentioning supports the right implementation of technologies in schools, nonetheless,
20. this is not happening because of the generational gap between digital natives and digital immigrants, and
21. teachers are in the last group (…) (04.08.2015)
22. **José:** thank you very much Camila for your clarification regarding the uses of ICT from a formal perspective.
23. Personally, I am not very keen on the web, however, I know how to use it. I understand your point of view
24. about the advantages technology can bring to education in terms of students' motivation and identification
25. of threats. However, I think we need to know the limits and set limits to make better use of technology (…)
26. (07.08.2015)

In this extended episode, José referred to teachers' use of Facebook for sharing material and information with two apparent purposes: (a) to support Camila's previous claims about teachers' lack of technological skills and (b) to introduce his standpoint on the "complementary" role that technology should have in schools in Chile (6.4:1-7). The references to Camila's ideas directly demonstrated that Camila contributed and performed actions to support her ideas. In addition, Camila continued by thanking José for his contribution and then indirectly disagreed with his claims about the role that ICT should have in education, which she regarded as a skill of the new century, pointing out that it is "not an option" (6.4:9). Camila continued by performing other actions. For example, she made direct references and explained MINEDUC documents in detail –previously added as a link (6.4:12)–; reflected on the implications of ICT for learning (6.4:13-15); added two awareness raising questions (6.4:15-16), pasted a picture to reinforce her claims (6.4:18), and finally contested José's idea with an explanation (6:4:19-21). These actions broadly involved directly and indirectly disagreeing with José's ideas about the role of technology in education in her attempt to unify understanding. This triggered José's answers to negotiate perspectives with

the aim of resolving the discrepancies in opinion about technology use in lines 23 to 25. Camila's analysis of the situation by referencing documents, reflecting on technology implications, and indirectly inviting José to reflect are actions aimed at convincing him of the potential of ICT for education by challenging his understanding, thereby creating shared meaning regarding the uses of technology. I argue that sharing the image not only supported Camila's argument regarding the key role of ICT in schools; also, the image opened spaces of understanding that led José to construct his personal interpretation of the ICT Matrix by considering it "formal" in line 22.

Inserting comments within other participants' posts was a practice that Camila started in team one and was replicated by Carlo and myself to convey meaning clearly in the wiki. Excerpt 6.5 shows Camila adding embedded comments –in bold– between my contributions to directly address my ideas about teachers' collaborative work at schools and effective feedback for students.

Excerpt 6. 5: from problem-solving wiki

Miguel: (…) in relation to the studying habit strategies you propose, I believe that this must be addressed in a holistic way, with the other teachers rowing in the same direction. It happens sometimes that the demands are not the same in all the subjects, which generates a sense of disorientation that can affect the students' habits. The leadership of the heads of department is crucial in this strategy. **Camila: I agree with you in this point, the students can quickly identify the teachers who do not work in the same way.** Regarding the teacher-students relationship, to avoid frustrations, this must be combined with clear goals and an effective feedback that creates a positive impact (on students). to achieve this, I check tests with the class or make detailed personal comments in the tests. This leads the learning cycle to expand over time and enables the students to know clearly what they need to improve. **Camila: We have used that strategy to give feedback in writing tasks. We called it "mini-conferences". It is very positive for the student who is receiving (it is individual) the feedback, however, it is difficult to implement** (…).

In this interaction excerpt, Camila first agreed with my vision of teachers' working in the same direction to avoid students' confusion, and then added comments on the students' abilities to identify different working styles (6.5:4-5). In her second comment, she complemented my ideas on test correction, with her teaching experiences on mini-conferences and their positive and negative aspects in lines 9 to 11. I argue that indented comments (as well as references to other participants' views) cut the linearity of extensive writing in the wiki and made it possible to a) address ideas of interest on specific topics to negotiate perspectives such as agreements or b) share

experiences which sometimes fade due to the length of some comments. In addition, I consider that Camila's way of addressing my ideas exemplifies how she approached my role in the collaborative activity. Her actions placed us in equal roles from which we interacted to negotiate her perspectives, thus encouraging my facilitator practices to evolve into more constructive ones, such as sharing new material, providing new ideas, and asking further questions.

As a final remark, the wiki platform gave teachers in this team the flexibility to potentially restructure and expand what they had written, as the history bar of changes exemplifies in the right side of figure 6.5. Here, on August 3, Camila added one contribution at different times: 13:45, 17:07, and 21:28. It can be argued that this asynchronous approach benefited the participants by enabling them to revisit and edit comments to make them more significant for the others and granted them time to reflect on their ideas.

Figure 6. 5 Camila contributing at different times

6.3.1.1 Key findings from the Technology team

In this team, collaborative practices of negotiation emerged after teachers applied their explanatory and referential style of contributing in the wiki, which included reflections about education, descriptions and explanations of past teaching experiences, references to the educational system, and references to others by naming them directly. These mechanisms granted opportunities to follow and expand the course of discussion, which subsequently led teachers to engage in new

negotiations. The use of mediational means, such as hyperlinks or photos, allowed teachers to express their points of view with clarity, while also promoting the creation of references to the Chilean educational system to make it easier for others to understand their points. Camila adopted a leading role in the wiki by initiating contributions, sharing material, asking questions, and interacting actively in all the problems. This was an important aspect in the negotiation processes in this team, as its members adopted a collaborative approach by referencing, explaining, replying to comments, and using resources, among other actions. In addition, Camila addressed my ideas directly, through indented comments, to create direct references to my ideas, evidencing her need to comment on a specific topic which could have faded among the extended comments that the social practice of the wiki promoted. First and foremost, Camila's collaborative actions and attitudes encouraged my facilitator practices to evolve while creating a collaborative state informed by our mutuality to understand perspectives, her involvement of my ideas in the discussion, and –broadly speaking– the more symmetrical positioning of our roles.

The strategies that teachers implemented in their projects emerged through their contributions in the wiki. Nonetheless, these strategies emerged primarily after their individual contributions as part of the discussions, and only when the joint construction of strategies from joint decisions did not happen. Here, I argue that the extensive nature of contribution allowed negotiation processes regarding joint decisions to become visible, instead of disappearing within lengthy discussions. Trust building in this team occurred after the participants discussed others' contributions respectfully; therefore, sharing emotional accounts and calling each other by name were important components for teachers to feel at ease in the space of negotiation that the wiki provided. Interestingly, teachers approached my role as an equal with whom they could discuss aspects of interest for them. Therefore, my facilitation practices (e.g. asking questions, sharing, agreeing) evolved and merged teachers' actions naturally in an inclusive approach where they directly referenced, contested, challenged, and addressed my ideas.

6.3.2 Collaboration and collaborative practices: Behaviour team

Teachers' participation in this team peaked in the first two weeks and stopped at the beginning of week three. Fernanda, Nelson, and Claudio commented sporadically and without naming each other in their contributions. They discussed problems in two areas (see section 4.2.4, p.112).

Nelson contributed 3 times, Fernanda 5 times, and Claudio 4 times, which added up to 5 letter size pages of discussions. Claudio was the most prolific contributor (403 words), while Fernanda was the least active (25 words to thank others for their contributions). Figure 6. 4 illustrates how this wiki looked like. Nadia, the fourth member of this team, left the study. In this team, none of the teachers adopted a leading role and strategies emerged after their independent contributions.

Excerpt 6.6 below illustrates Nelson's, Fernanda's, and Claudio's approach to contributing, which involved not naming others, giving direct advice about the problems presented, and illustrating the use of editing tools for conveying meaning in the wiki. To illustrate their performance, I present a summarised version of their interactions for addressing problem two to show how they approached the problem-solving activity over two weeks. This episode starts with Nelson's first contribution to seek a solution to students' bad behaviour and parental involvement.

Excerpt 6.6: from problem-solving wiki

1. **Nelson:** This can sound inappropriate but to solve the same problem of bad behaviour I bet the students that
2. I could teach my whole lesson (summarized) in less than one minute, if I did not achieve that, I would give
3. them all a 7.0[11], but if I succeeded the students would have to keep the classroom clean (…). Now, when I
4. enter the classroom, they are always organized, and the classroom is clean. (…). Additionally, it could be a
5. useful strategy to coordinate activities with the parents so they could feel included, and then start working
6. systematically with them. (05.08.2015)
7. **Miguel:** (…) It does not sound inappropriate. On the contrary, this is a good strategy disguised as a challenge
8. to enhance habits of responsibility and order in the students. (…) the problem I see with this strategy though
9. is that it can work with some classes only. (…) don't you think? (05.08.2015)
10. **Fernanda:** (…) I try to find a big number of movies that relate to poor areas with violence, etc. like City of
11. God, Dangerous Minds, (…) You could also use lots of humour (…) You could set rules before the class
12. begins in exchange for finishing the class 5 minutes earlier (…). With respect to families, creating a diary
13. that is written by all students and parents at their homes, and answering reflective questions related to
14. coexistence, and personal relationships could bring parents closer to the school. (10.08.2015)
15. **Miguel**: It is a good idea to show different realities through movies. Regarding sense of humour, this is
16. always welcomed, however, the use of humour must be moderated (…) so students don't misinterpret it. In
17. vulnerable schools, I believe that clear rules and a firm attitude can be good allies (…) (12.08.2015)
18. **Claudio:** I have some clear ideas related to this topic (…) the most important thing is to have a school code
19. of practice (…) that includes all the "sanctions" or "remedial actions" (the ministry of education fears the

11 A 7.0 is the highest score for evaluative purposes in Chilean schools, which is equivalent to an A+ in the USA.

word SANCTIONS, so now it should be REMEDIAL ACTION). In my experience, I have seen that when the students see that the school is well organized regarding discipline it is easier to implement regulations (…). It is also good, at the beginning of the school year (…), to give parents a document with the main aspects of the code of practice and make them sign it. This is evidence of their commitment (…) (15.08.2015) **Miguel:** (…) thanks for your ideas, it seems reasonable to have a structured code of practice. I would add that the students' opinions should be taken into consideration in this code of practice. For example, do you organize workshops at the beginning of the year where the students comment and give ideas about things they consider important. Do you think that this is achievable? (15.08.2015) **Claudio:** at the end of the school year, we give a survey to the students and ask for their suggestions (…) (18.08.2015)

In this extensive episode, teachers interact without naming each other to seek a solution to the problems presented, although they include broad references like school experiences or pedagogical experiences. Nelson started with an anecdote to face the problem of students' misbehaviour (6.6:1-4). Then, he briefly mentioned how activities can improve parental involvement in line 5, although not explaining how. In this regard, Nelson's initiation of the conversation resembles these participants initial contributions, addressing the questions directly by sharing classroom experiences to later give advice on what to do. After my supporting comments and attempts to expand interaction by asking "don't you think?" (6.6:9), Fernanda advised three solutions to the problem: watching movies in the classroom, using humour, and setting rules to negotiate behaviour (6.6:10-12): Finally, she suggested the use of a diary to strengthen parental involvement in lines 12 to 14. While doing this, Fernanda did not make any references to Nelson's comments, but mainly gave advice and suggested ways to deal with the issue. I praised Fernanda's contribution and commented on the potential problems the use of humour could bring in classes (6.6:15-16). However, my comments did not expand further interactions. At this point, Claudio entered the conversation advising on the importance of a code of practice and parental involvement in lines 18 to 21. Here, Claudio also shared his school experiences in terms of students' involvement in line 20. I thanked him for his ideas and offered an alternative, clarifying my proposal with an example, to finally open opportunities for interaction through a question in line 28. Claudio answered a question briefly, mainly to satisfy my curiosity. In this episode, the three teachers do not make any clear references to each other's ideas to contribute, but mainly give advice to seek a solution to the problem presented. I argue that the experiential and advice-focused tone of the contributions could be a practice that the teachers adopted when they saw how others contributed.

This replication could have been strengthened by the absence of a peer leader who shared material, asked questions, or created instances of negotiation, apart from me. The teachers also seemed to ignore my questions (6.6:9) or replied to them descriptively without expanding arguments (6.6:29). It can be argued that the sporadic participation of the members of this team from August 5th to the 18th, prevented the smooth exchanges of ideas, prompt reply to comments, and engagement in the discussion topics more fluidly. This led teachers to mainly interact with the problem presented rather than with the ideas of others, hence evidencing how a collaborative state is affected by individualistic comments without references to others. It is interesting to note that, in this episode, Claudio used parentheses, quotation marks, and capitalization to add ideas, emphasize his intentions, and illustrate the evolution of terminologies in education (6.6:19-20). This indicates the importance of the mechanisms used by the teachers in an online environment to convey clarity and understanding within groups, an aspect further expanded in the section discussing the methodology team.

None of the teachers in this team shared any direct resources; however, Nelson mentioned documents in his contribution to support Fernanda's problem. Excerpt 6.7 serves two purposes: it shows how teachers supported each other by giving advice and outlines the mechanisms that they used to convey meaning in the wiki. This excerpt involves all the participants and starts with Nelson's first contribution to problem one on how to support SEN/D students' needs in classrooms.

Excerpt 6.7: from problem-solving wiki

1. **Nelson: (**…) I work with a group of PIE[12] professionals that support my duties to work with the curriculum
2. adaptations (…) however, in my first school I worked without them, so I sought support from an educational
3. psychologist, she taught me several techniques to work with NEEP (permanent special needs) and NEET
4. (transitory special needs) students. That is my best advice, find someone who knows and gives you
5. guidelines to work better (…). I also recommend that you find regulation number 170, there you can find
6. guidelines to work with students with NEE (special educational needs) (…) (05.08.2015)
7. **Miguel**: Thanks for your comments, ideas, and documents you propose (…). You are lucky to have a working
8. team that supports you (…). I propose to do a diagnosis, ideally by a professional (…) (05.08.2015)
9. **Fernanda**: That was my problem. Unfortunately, the school where I work is small, so we do not have a
10. big teacher staff, there is no PIE either. I have checked the MINEDUC documents and they seem a bit

12 School integration program

repetitive, but not necessarily useless…I believe that I will collect different books with different tips at the end. I pour lots of love and dedication into my classes to do them well and affectively. The problem is to satisfy the need of my students evenly, that is difficult, I think. (10.08.2015)

Miguel: the reality of your school can be so challenging... However, as you mentioned, care and dedication are big allies to overcome the lack of human and material resources. (…) I used to separate my students in different groups and I assigned them activities depending on their skills. (…) is there any specific activity that *you* (addressing all teachers) have applied to cover SEN/D? (…) (11.08.2015)

Claudio: "fortunately, in the school where I work, there is an inclusive team with 9 teachers, these teachers coordinate all the PIE (School Integration Program) work at school. The students are assisted according to their diagnosis and special needs. The only problem we have faced is that the teacher is in the class of the students who receive support (…) and the rest of the class become distracted with that situation. (18.08.2015)

In this episode, teachers provided advice to support SEN/D students' needs in classrooms. Nelson drew on his first working experience to advice seeking support from an educational psychologist (6.7:2-3); then, he described how the psychologist supported him in line 3 and 4. While doing this, Nelson used specific jargon, such as NEEP and NEET in line 3. He finished his contribution by directly advising reading regulation number 170 (6.7:5). I argue that Nelson's experiential account and direct advice demonstrated a vertical division of labour approach to collaboration by giving a solution to the problem, involving no references and no coordination of roles, but advice focused on self-performance. Yet, these recommendations seemed to resonate with Fernanda's current reality: she described her problem in line 9, informed the other participants of contextual limitations and actions already carried out (6.7:10), and reintroduced her problem in line 12 and 13, all of which hints at her need for help. I argue that Nelson's contributions, because of their advisory and self-referential tone, were not an inviting basis for the other teachers to share additional ideas; however, I also believe that pedagogical references such as NEET and NEEP, as well as experiential accounts, supported Fernanda with ideas implied in line 11, when she mentioned "I will collect different books with different tips", and also support building trust because they make references to teaching practices. As the interaction continued, I made empathic comments regarding Fernanda's situation, thus reinforcing her caring techniques and providing an experiential idea; then, I involved others in the conversation in lines 14 to 17. Then came Claudio's experiential and descriptive account on his SEN/D context in lines 18 & 19, along with his school's challenges to support special needs students in lines 20 and 21. At this point, though, he did not make any references to Fernanda. I argue that Claudio's last contribution broadly exemplifies the

nature of the comments in this team, in which the participants did not negotiate their perspectives, made no references to each other, did not build on each other's ideas, did not use complementary resources, and displayed no expressions of agreement/disagreement, among others.

6.3.2.1 Key findings from the Behaviour team

Teachers' negotiation practices manifested themselves in the expression of their individual perspectives in a rather descriptive approach, including direct advice to others but without any direct references such as explicitly naming or addressing the ideas of others. Here, findings showed that not naming others and descriptive contributions were not good grounds for negotiation to flourish in a wiki. Interestingly, teachers used capitalization and parentheses to convey their ideas clearly in the wiki. These mechanisms were useful for creating references about the teaching profession. The few participation structures in this team and some attitudinal dispositions (e.g. short replies or no replies to comments) hindered negotiation processes. First and foremost, the absence of a teacher adopting a leading role prevented the engagement of others in discussion, and hence I became the main articulator of instances of interaction through questions and comments in my capacity as facilitator. Nonetheless, my questions and comments seemed not to create further instances of interaction either. Here, some attitudes to interacting (e.g. descriptions, participant-centred contributions, short replies to my comments) affected the evolution of my practices, which caused me to ask more questions to establish relations with the teachers. Collaboration manifested itself through direct support and ideas to face the teachers' problems. In consequence, negotiation mechanisms regarding joint-decision making, agreeing, or disagreeing did support the emergence of the strategies. These strategies emerged after teachers' independent ideas in the wiki, in a rather vertical division of labour approach to collaboration, and where teachers maintained an advisory attitude from the beginning until the end of the activity.

6.3.3 Collaboration and collaborative practices: Methodology team

Carolina, Patricio, Danitza, and Roberto formed this team. Overall, teachers' participation extended over two weeks, with Roberto and Danitza being the main contributors with 7 and 8 comments respectively. Patricio's participation was limited, with two explanatory contributions

(over a page long) without naming others, while Carolina also commented twice, in a shorter and mainly non-referential fashion. In this regard, Carolina mentioned how difficult it was for her to contribute to the wiki through her mobile device, suggesting that using Google Docs as a wiki can be incompatible with certain mobile technologies. In total, contributions added up to 12 letter size pages of discussions. The wiki outlined three student-related problematic areas (see section 4.2.4, p.112). In this team, Danitza and Roberto mainly commented about methodological aspects and engaged in collaborative practices involving building trust and negotiation. Teachers did not share any material, but I did in my role as facilitator.

Danitza, Roberto, and Patricio's style of writing was explanatory and supportive. I use the term explanatory as their contributions included classroom anecdotes, methodological tips, reflections about education, and comments addressing the socio-cultural reality of schools in Chile. Their writing style was also supportive as teachers provided advice on the problems discussed in an explanatory way. Excerpt 6.8 serves two purposes: it illustrates how an explanatory writing style triggers broader negotiation mechanisms while not mentioning others directly; also, it illustrates teachers' manoeuvres to convey meaning clearly to the group in online environments. This is important because it shows the relationship between the instructions provided for an activity and teachers' actions. This episode starts with Roberto's first contribution to problem 1:

Excerpt 6.8: from problem-solving wiki

1. **Roberto:** Hello Everyone! I am Roberto from Concepción.
2. This is a situation that I see yearly in the Liceo where I work (…) as we have participated several times
3. in teachers' and students' strikes, that at the end, delay or interrupt the schedule. First, I took the
4. essential parts of the current curriculum (…) if there are things that I can omit (…) I do it (and the
5. objective is achieved anyway). Second, I implement systematic evaluation (…). My students are used to
6. them [the evaluations]. (…) with other colleagues, we have introduced the use of portfolios (…), so the
7. students are pressured to compile the worksheets in class (…). I have tried to implement that in my classes,
8. but it takes time to incorporate the culture of systematicity in the students. There are colleagues who
9. already started this year, and now they are seeing results. I hope to see mine as well. (08.08.2015)
10. **Miguel:** (…) the idea of the portfolio is practical, in addition, leads students to develop a sense of
11. responsibility (…) (10.08.2015)
12. **Danitza**: Hello! With respect to the first problem (…) one as a teacher always expects that all the students
13. understand what we teach, and sometimes the curriculum is so extensive that we see ourselves delivering

14. the contents without leaving time for feedback, and even more when our problematic reality does not help
15. much. My advice (…) is to teach a concrete topic in no longer than 30 minutes of explanation, and that in the
16. remaining time of the class, the topic is reinforced with guided and interactive activities (…). Second, (…)
17. to capture the learning process, it is advisable to evaluate every two weeks though quizzes, or short tests to
18. develop the habit of study in classes (…). I had implemented the review of activities in classes, as they were
19. going to be considered as a progress evaluation. For me, this was like a two-edged sword, as the 70% of
20. the class failed (…). (10.08.2015)
21. ***Later*** (…)
22. **Patricio:** In sciences, in general, we deal with the few hours we have in all levels of secondary education
23. (2 h), and with the academic curriculum which is very extensive in terms of contents, that is why losing one
24. hour of classes for curricular or extracurricular activities is a major drawback for teaching contents. In these
25. two years of teaching experience, I have had to deal with this problem, and I have learnt to use and implement
26. more accurate methodological strategies like portfolios, which are constructed class by class based on a
27. worksheet that invites the students to create a summary for each class (…) (13.08.2015)

In this extended episode, although Roberto, Danitza, and Patricio do not name each other while interacting, their ideas collide. Roberto started greeting the group and introducing himself (6.6:1), to later address the first problem by making references to school strikes in line 3. He continued commenting on the problems outlined in the instruction tidily with the ordinal numbers "first" and "second" in lines 3 and 5 respectively. While doing this, Roberto added two recommendations to face the problems, condensing contents and using portfolios (6.6:4-6), recommendations based on personal experiences that convey information about aspects of teaching practice. After my comments acknowledging his ideas on portfolios (6.6:10-11), Danitza entered the conversation structuring her contribution with ordinal numbers as well (6.6:12,16), adding clarity and organization to her ideas and thus making it easier to understand what she wanted to say about the questions. In her contribution, Danitza also added direct advice in lines 15 and 17 and described a classroom experience advocating for challenges in that respect. Interestingly, Danitza indirectly addressed Roberto's ideas on the 'problematic' teaching reality due to strikes (6.6:14). Here, I argue that Roberto's earlier contribution (6.6:3) addressed aspects of the teaching culture which promoted Danitza's references to his ideas; therefore, he informed the participants of common contextual realities affecting the teaching profession or, as I argue, a shared domain of interest. Later in the discussion, Patricio contributes and refers to portfolios in line 26, a topic mentioned by Roberto (6.6:6), but without making any direct references to him. I argue that Roberto's references to portfolios prompted Patricio to give his opinion about their usage, perhaps to improve

the idea or to share common knowledge that can be useful for solving the problem discussed. Overall, teachers' collaborative practices in this episode resembled those of the behaviour team (i.e. comments without naming others), although in this episode teachers provided explanations, problematized the situation with examples, and added socio-cultural references, which I argue supports negotiation processes of articulation of perspectives and joint references for shared understanding.

Excerpt 6.9 expands on these team negotiation practices and illustrates how collaboration manifested itself in the wiki through more affective approaches leading to a more collegial form of collaboration. The episode below started after my comments on how to enhance oral skills in English classes, which prompted Roberto to add new views on his problem.

Excerpt 6.9: from problem-solving wiki

1. **Roberto**: It has been difficult to strengthen the oral skills of my kids. I have been implementing board
2. games and reading short news where students write their answers to then read them out loud. Just now, I
3. am looking for tongue twisters and short videos so they repeat or at least assimilate sounds (…). I am trying
4. but it is a long process. (08.08.2015)
5. **Miguel:** (…) These are some videos that I have used to activate conversations, and therefore they can help
6. to improve oral skills (…) [*I add 7 video links*]. (10.08.2015)
7. **Danitza:** Hello Roberto! What a difficult problem, considering that you have done everything
8. you can and still don't have positive results. However, it is good as you are innovating your pedagogical
9. practices daily with different strategies. My advice is to continue like this! Innovating and
10. complementing that difficult skill with the students that at times is difficult even in Spanish. (…) There is
11. one idea that comes to my mind… have you thought about inviting a native speaker to your class so the
12. students interview him/her? (11.08.2015)
13. **Roberto:** Hello Danitza, the truth is that we have been thinking about implementing that idea for a long
14. time, but we have not been able to achieve it. It has been a bit discouraging. However, one of the things we
15. have tried in the municipal teachers' network is to support each other in the classroom. It is clear that we
16. are not native speakers, nonetheless, for the students it is highly motivating to see someone new (…).
17. It has worked well, and it is very easy for arranging activities. We are improving little by little (…) (15.08.2015)
18. **Carolina:** Hello Everyone! One of the things that happens to me, it is that the students are used to listening
19. to Spanish and they expect all the instructions to be given in their mother tongue. I motivate them to use
20. the language with basic structures, for example, go to the toilet, (…). As some other teachers, I have tried
21. oral presentations, dialogues, (…) I also believe that working with mentors has been effective (…) (21.08.2015)

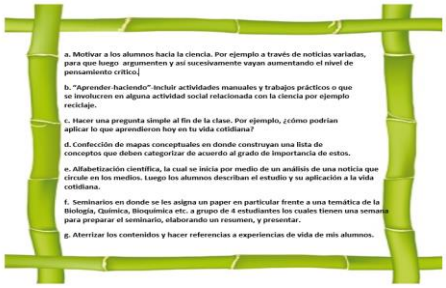
In this excerpt, Danitza, Carolina, and myself supported Roberto to improve oral skills in his classes, after he described the activities he had applied to do this in lines 1 to 4 and expressed concerns about how long it takes to get results (6.9:4). I then added 7 links with videos to improve oral skills (6.9:6). Danitza continued with empathetic comments addressing the difficulties of his problem in lines 7 and 8 and praised him for the work done in lines 8 and 9. Danitza also encouraged him to "continue like this!" (6.9:9), to finally suggest –through a question– inviting a native speaker to his class in lines 11 and 12. Roberto replied by mentioning the difficulties of contacting native speakers, sharing his feelings, and introducing the alternative of municipal networks in Chile (6.9:13-15). I argue that Danitza's motivational remark triggered Roberto to open his emotions, thinking about the changes and strategies he had tried, thus demonstrating how affective remarks can open spaces to elaborate on ideas. Finally, Carolina entered the discussion and provided support by recalling personal teaching experiences by giving examples on what actions to take. These actions involved giving instructions, presenting conversational strategies, and pairing students with a mentor (6.9:18-21). I argue that collaboration in this episode adopts different dimensions. First, a more supportive dimension emerged when I shared video links for strengthening oral skills. Second, a more affective approach resulted from Danitza's empathetic comments and motivation for trust building, since they supported Roberto's professional self-esteem and teaching morale; likewise Carolina shared her experiential account with achievable strategies which also acted as pointers on potential things to do to boost oral proficiency.

In this team, I asked questions and also shared a summary of teachers' contributions to organize the wiki ideas, address their interests/needs, and promote collaboration. Excerpt 6.10 illustrates adaptations in my facilitator practices while complementing my questions and Danitza's response to these adaptations. To illustrate this, I present a summarised episode of problem 2, which deals with how to enhance analytical skills in science classes. This episode started with my initial comment which aimed at motivating interaction.

Excerpt 6.10: from problem-solving wiki

1. **Miguel**: (…) to enhance analytical skills (…) it is necessary to adopt transversal strategies that
2. take the students out of their routines and motivate them to do something different. For example, ask
3. clever questions that include relevant aspects for the students, link the contents with other subjects, etc.
4. How would you enhance analytical skills in science classes? (05.08.2015)

5. [*Danitza and Roberto's interaction available in Excerpt 5. 7 p.164*]
6. **Patricio**: (…) one of the strategies that I apply in my classes are mind maps about a content we have seen
7. in classes. I invite the students to create a list of concepts that need to be organized according to their
8. importance in relation to the content we are studying. In this way, it is easier for them to create the map,
9. respect the structure, organize the elements and summarize the main aspects of a concept (…)
10. another way of contributing to the development of critical thinking is through scientific literacy
11. which involves the analysis of scientific news (…) where the students describe the study, its application in
12. daily life, and its categorization within a set of themes (…) I work with this strategy in several classes and
13. it works quite well (…) (13.08.2015)
14. ***Carolina***: (…) what I have done is to implement 'learning by doing'. Here, I have tried hard to help
15. students to continue improving, especially in English. I also try to simplify the contents and
16. make references to the experiences of the students and those around them; at the same time, I stimulate
17. their minds for them to explore their imagination. (13.08.2015)
18. **Miguel:** (…) Very interesting ideas for dealing with the problem. Here some of the most relevant points so
19. far (I attach a photo with a summary of their ideas) Do you think we can add something else?



(18.08.2015)

20. **Danitza:** Thanks Miguel (…) I personally liked the idea of mind maps (…) and scientific literacy
21. (…) as they can be easily applicable in my classes. Seminars seem relevant mainly for secondary school
22. students, although I organize 2 public speaking presentations with my year 5 class every year.
23. This is basically the same as the seminar but in an adapted format for the children. When I do this, I
24. remind my students about the importance of respecting other ideas (…) (18.08.2015)

This episode showed my practices as a facilitator in the discussion, specifically, how I adapted motivational and instrumental support beyond the scope of my questions, while also illustrating teachers' responses after my contributions. I started the discussion suggesting teachers to adopt innovative strategies to make students think further, to then provide examples and reintroduce the problem in a question (6.10: 2-4). Just after Danitza and Roberto's interaction in Excerpt 5. 7. (p. 164), Patricio commented on two strategies as a solution to enhance analytical skills in science classes, including mind maps and scientific literacy in lines 6 and 10 respectively. While doing this, Patricio did not name any others for reference, but clearly explained his actions. At this point,

Carolina added her contribution from an English teacher perspective. Her ideas involve simplifying the contexts, making references to students' experiences, and asking questions to improve students' understanding in lines 14 to 17. Later, after Patricio's and Carolina's contributions, I praised the teachers' ideas, attached a photo with a summary of the discussion, and asked an open question regarding the summary provided (6.10:18-19). This action sought to create interaction opportunities after I noticed that my questions were not prompting collaborative engagement. The summary was picked up by Danitza, who thanked me, commented on its usefulness for her (6.10: 21), and expanded on the idea of public speaking presentations in lines 22 to 24. The way in which I supported teachers involved the use of questions with suggestions on actions to take, praising and validating their contributions, and adding a summary photo to clarify the main areas of discussion. I argue that Patricio and Carolina approached my question (6.10:4) mainly as a starting point to elaborate on their individual ideas. Although Danitza did the same in line 20 and 21, her reply evidenced a more explicit engagement with me by thanking me for my contribution and adding extra perspectives. This suggests that teachers approach my facilitator role and my practices (e.g. questioning, sharing) differently depending on their specific interests, needs, or attitudes regarding conversations in the wiki. All in all, my adaptations caused my practices to move away from questions aimed at fostering interaction to a more inclusive approach (e.g. summary with their ideas, examples, clarification) as a way of addressing their needs and interests and thus encourage collaboration.

6.3.3.1. Key findings from the Methodology team

In this team, teachers' collaborative practices emerged due to Patricio, Danitza, and Roberto's explanatory writing style while giving advice to others. Here, their ideas supported the creation of references to the teaching and educational culture in Chile, which helped them expand their understanding. Danitza and Roberto engaged in more collegial approaches to collaboration, manifested through Danitza's empathetic comments, motivational remarks, and praise for Roberto's efforts to tackle his teaching challenges. Here, Danitza's affective writing style promoted negotiation processes with Roberto. In this team, teachers used ordinal numbers to convey their ideas clearly while writing in a wiki, evidencing the impact of the instruction for the achievement of the problem-solving goal. First and foremost, I shifted my practices as a facilitator:

I went from asking questions to addressing the participants' needs and interests using summaries, examples, and explanations. These adaptations were approached differently by the teachers: while Danitza and Roberto replied, thanked me, and created channels of interaction after my contributions, Patricio and Carolina just replied to my questions without generating further interactions or comments regarding my ideas. Here, I argue that the few participatory practices affected Patricio and Carolina's relations with me and others in the wiki, along with their specific needs, interests, and attitudes regarding collaboration online.

6.4 Summary

This chapter drew on the collaborative activity occurring in three wikis where the eleven participants were grouped into teams and invited to work collaboratively to solve problems affecting their practices. Interaction analysis of the collaborative activity revealed that Google Docs (as a wiki) mediated professional development processes by opening spaces of socialization, reflection, and negotiation of ideas between teachers. Here, collaboration did not manifest itself through teachers making joint efforts to construct strategies, but through individual efforts such as giving advice, sharing material, and presenting personal experiences to seek a solution to the problems discussed. In this regard, collaboration adopted collegial manifestations in more emotional, respectful, and supportive terms; most importantly, teachers did not negotiate their roles when collaborating but mainly maintained a supportive attitude throughout the collaborative activity. This promoted sporadic changes in collaborative relations and therefore sporadic negotiation processes. In this regard, I argued that the asynchronous nature of interaction, comment length, and sporadic participation of some teachers were among the factors limiting collaborative practices in the teams.

Collaborative trust building practices showed that teachers had a positive attitude to collaboration and collaborative activity. However, social interaction was limited and concise in the social wiki and teachers mainly expressed similarities in their interests. Here, I noticed that the launch of the problem-solving wiki could have affected social participation. The use of editing tools facilitated collaborative practices of negotiation by enabling participants to make references more visible and giving clarity to ideas. In addition, the use of hyperlinks and photos enhanced collaborative practices of negotiation by complementing ideas about education with which the participants could

agree or disagree and by providing additional input for reference and meaning making. Most importantly, explanations of ideas and direct references supported the sequencing of interactions and the emergence of further practices of negotiation (e.g. convincing, agreeing, disagreeing), while descriptions of ideas without direct references like names or comments on others' ideas did not facilitate the emergence of negotiation in the wiki.

Finally, my facilitator practices evolved in terms of practical actions (e.g. less questions and more opportunities to address needs/interests in summaries or through examples) after my realization that a question-based strategy was not always productive for collaborative engagement. Here, findings suggested that my facilitation role and practices were approached differently by the teachers: while some teachers responded to my contributions, thanked me for my comments, and engaged in collegial terms with me, others ignored my questions or replied succinctly to my requests. All this highlights the importance of mutuality for collaboration to occur between a facilitator (me) and participants; also, more importantly, it stresses the fact that this mutuality grows when interactions are relevant to teachers' needs and interests and when the participants have a positive attitude to collaboration.

Chapter 7: Discussion of Findings

Introduction

In this chapter, I discuss the key findings of The Wiki Project regarding teachers' professional development and collaboration. To do this, I consider my overall research aim; i.e. exploring the potential of technology for mediating the professional development process of a group of teachers solving problems remotely to answer the research questions proposed:

1. How does a technology-enhanced action research opportunity mediate the process of teachers' professional development?
2. How do collaboration and collaborative practices manifest through the process of professional development of teachers working in a wiki?
3. How do teachers approach support, guidance, and facilitation in the professional development experience?

These questions act as a frame to discuss the key findings presented in section 5.4 (p.169) and 6.4 (p.199) respectively. Overall, findings in this study suggested that the technology-enhanced action research approach worked well for some teachers to satisfy their need to solve problems in their practices, although it did not work well for others. For me, this finding demonstrated that the technological mediation of professional development in The Wiki Project offered possibilities and challenges for engaging in collaborative and reflective processes; also, this observation revealed that the impact of the context, the mode of communication the wiki promoted, our collaborative relationships, and individual attitudes to online collaboration and technology use played their part in the achievement of teachers' learning. By considering these ideas, I will start discussing in section 7.1 (p.202) findings about technology mediation from three points. I begin by addressing considerations regarding the possibilities and challenges that the socio-cultural context imposes for online professional development, thus situating the discussion in a broader setting. I then move to the professional development processes, namely reflection and collaboration, and their manifestations in online settings, to finally discuss findings about teachers' participation in the social practice of professional development by addressing online and offline findings.

The second broad area in section 7.2 (p.213) is centred on collaboration in a wiki. Here, I start by discussing findings about the professional development spaces that the wiki opened with regard to the activity, the asynchronous nature of communication, and the editing tools available. I felt this is important for highlighting challenges and possibilities in social interaction that a wiki promoted in teachers. After this, I discuss the dimensions that collaboration adopted in the wiki, which suggested a more collegial and supportive approach informed by division of labour. Finally, in section 7.3 (p.224), I discuss findings about my relationships with the teachers with a focus on collaborative activity; here, I adopt a more personal standpoint to discuss aspects of our relationships, including elements such as guidance, support, and facilitation, while also discussing how my practice as facilitator (and teacher educator) evolved and what I changed.

Research question 1

7.1 How does a technology-enhanced action research opportunity mediate the process of teachers' professional development?

7.1.1 Socio-cultural context

In the theoretical framework (see section 3.1.1, p.68), I defined socio-cultural context from two perspectives: one suggesting that the variety of social situations influenced the creation of context in relational levels (e.g. classroom level context is affected by school, government, etc.), while the other suggested that context is constructed in activity (Van Oers, 1998; Cole, 1996). This supports a definition of context as constantly affected and created by the cultural and social practices in which people participate and create, the socio-political and historical conditions of a country, people's interaction with others, and their use of tools in activities.

Findings in this study showed that the socio-cultural context in teachers' schools facilitated aspects of the technological mediation of professional development by defining their attitudes and possibilities regarding technology use for their professionalization. This broadly manifested itself through teachers' positive attitude to the uses of technology for their professional development (e.g. interacting in a wiki extensively, replying emails) and the overall Wiki Project experience, as expressed in their online interviews and profiles (see section, 6.2. p.173). For me, the array of

possibilities at the teachers' schools, including technological resources, the willingness of school authorities to allow them to join the project, and the further support of colleagues helped the participants fulfil their individual paths of development more integrally, in a supportive and mutual relationship of growth which recursively affected their intentions, dispositions, and attitudes to professional development online. Here, I consider that the teachers' personal interests, as expressed in their profiles, and the impact of over twenty years of technological policies through MINEDUC ENLACES, as presented in section 1.5 (p.22) and reviewed in section 2.4.4 (p.61), could have affected teachers' attitudes and intentions of developing professionally through technology. All in all, these aspects enabled teachers to see professional development from their own perspectives, sometimes critically, as evidenced in Danitza and Fernanda's comments in interviews, or as in Camila's account of how vocation and salaries influence attitudes to professional development in the wiki (see Excerpt 5.2, p. 143). These critical perspectives are important because they are aimed at challenging the intellectual position of ideas and actions for teachers' professional development, thus becoming a part of their professionalization (Evans, 2018). But more importantly, teachers' attitudes, dispositions, and interpretations regarding professional development in Chile demonstrated the complex interdependence (Cole, 1996) between socio-cultural context and professional development for the creation of meaning in relation to the situation (e.g. MINEDUC offering). This indicates that this mutuality and influence need to be the basis to understand the nature of professional development in Chile based on teachers' manifestations for broader changes. For example, the restructuring of MINEDUC as a benefactor state (see section 1.4.1, p.17) can break down hierarchical barriers and market-oriented models still preventing teachers from making teaching and learning decisions, thus encouraging them to strengthen their capacities in a socio-cultural mutuality between teachers and MINEDUC.

In the literature review (see section 2.4.2, p.52), I explained Salmon's (2000) and Garrison and colleagues' (2007) models for the acquisition of technology as a tool for learning. Here, engagement in several dimensions or following procedural stages were considered central components in the achievement of learning. I have also suggested that, in online professional development contexts, it is necessary for teachers to move fluidly into dimensions and processes of learning through social interaction (Vygotsky, 1978) in order to acquire mediational tools (Lantolf & Thorne, 2006; Ivic, 2000), participate in social practice (Wenger, 1998; Dreier, 1999),

reflect (Schön, 1987), and collaborate (Crook, 2000). Broadly speaking, my findings showed that some teachers, like Camila and Danitza, moved with fluidity into online dimensions and processes by negotiating ideas, making use of resources, or reflecting online in a way that was pertinent for their development, while other teachers like Fernanda experienced difficulties to engage in collaborative and reflective processes online. For me, this shows that the context created in (online) activities (Van Oers, 1998) both limited and granted opportunities for learning. For example, consider how teachers' sporadic contributions, direct advice, or descriptions of situations in the behaviour team limited negotiation processes for expanding perspectives or a closer collegial relationship for support, thus preventing engagement in dimensions of reflection, trust, or collaboration. All this hints at the relational impact of the social situation on the *weaving* and achievement of learning (Cole, 1996). In this regard, online communication was also affected by specific contextual situations, for instance, interruptions in communication as in the case of Danitza's interviews, which prompted her to shorten her answers in the narrative activity. I argue that situations like this were to be expected in online dimensions, so they could have been prevented by planning remedial strategies. However, unpredictable ones (e.g. failure in connectivity, blackouts) must be regarded as part of everyday life, hence forming part of the experiences of learning that inform our practices.

7.1.2 Collaboration and collegiality

In the literature review (see section 2.2.1, p.36), I outlined the intrapersonal dimensions of collegiality, including support, trust, and respect among people (Kelchtermans, 2006) and the dimensions that it adopts for collaborative activity (Little, 1990). A key finding in this study suggested that technologies (e.g. email, online conferencing systems, and wikis) mediated collaborative processes between me and the teachers involving relationships of support, mutual engagement, and trust. Thus, we made sense of the nature of their problems, the implications of their actions, and the impact of those actions on their professional development while interacting over time in a rather collegial approach to collaboration. This finding is relevant from three perspectives: (a) collaborative processes in The Wiki Project happened in interactions between myself and the teachers, therefore suggesting that teachers and myself performed collaborative practices; (b) collaborative processes happened through emails and online (face-to-face)

interviews, which suggests a more personal approach to communication; and (c) for these processes to happen, communication over time was needed, and I argue that action research provided a pertinent framework for collaboration. That is to say, technology mediated collaborative practices, intrapersonal relationships, and aspects of communication and collaboration within a framework over a period of time.

In the first regard, I argue that emails and online interviews mediated collaborative trust-building and negotiation practices for the construction of understanding between me and the teachers. Here, teachers' respectful tone in emails, honest interest in the study, and gratitude for the material that I shared were some of their collaborative practices embracing "a state of engagement" (Crook, 1999: 114) between us, before we naturally moved on to negotiation. In fact, the face-to-face components in Danitza and Fernanda's interview supported trust-building for collaboration through the narrative and orientation activities. Here, I suggest that seeing a real person (me) behind the project resulted in a secure and good start for the negotiation of perspectives in the future; i.e. the face-to-face component *enabled engagement* through physical presence (Wenger, 1998). The idea of including face-to-face components in online professional development programmes has been reported to be important in the professional development literature. For example, it keeps teachers from losing sight of what to do and increases motivation, as Srinivas' (2015) contended after facing complications with participation in a full online programme, while also supporting teachers' individual needs, helping them understand what to do, and motivating them to work online, as UNESCO's (2017) programmes with Mexican and Pakistani school teachers suggest. For me, this idea supports the view that it is necessary to keep professional development activity from depending on technology (Hennessy, Haßler, & Hofmann, 2016); instead, technology should be a supporting and functional complement providing connectivity, networking, and opportunities to learn with others, among other possibilities.

In the negotiation arena, email communication helped teachers present their ideas with clarity, for example, by attaching material, describing contextual aspects to create "joint references" with me (Crook, 1999:106), or asking questions and expressing concerns based on which I could send them suggestions, material, and questions for expanding the negotiation process. Mainly, my questions encouraged teachers to express their perspectives and boosted their understanding about the

relevance of their actions in a continual and gradual negotiation process (Roschelle & Teasley, 1995). This finding is interesting because it suggests that emails opened a space of negotiation of ideas in a dynamic and productive way within a reasonable timespan, which enabled teachers to follow a course of actions, communicating asymmetrically with me, creating references, sharing conceptions, or adopting roles for engagement in their problems (Rochelle & Teasley, 1995; Dillenbourg & Baker, 1996; Crook, 1999; Stahl, 2003). However, findings also revealed that some replies to my comments (e.g. Fernanda's just thanking me for my contributions) prevented the process of negotiation from emerging more fluidly and thus made it harder to understand the problem and its solutions. This revealed that teachers' individual willingness to collaborate is a core aspect of the collaborative process in both the online and face-to-face realms (Crook, 2000; Schwartz, 1998) and also defined aspects of my facilitator practices as further discussed in section 7.3 (p.224).

In the second realm, the fact that collaborative processes happened through one-to-one means of communication in The Wiki Project hinted at the pertinence of some technologies for collaboration to occur. Here, I argue that the practicality of email communication and the personal dimension it promotes for addressing pedagogical ideas in an easy and direct way (Crook, 2011), along with the dimensions of my supportive and guiding role in The Wiki Project, demonstrated that teachers and I engaged in collaborative relationships in more active and direct way. Thus, email communication stood as a relevant alternative for teachers to contact me and address their problems of practice directly and personally. For me, this also suggests the important role I adopted in teachers' projects, where I became a remote source of support regarding practical needs. Findings also showed that online interviews helped teachers to evaluate aspects of their projects, inquire about research, and create meaning about their experience when collaborating with me. Here, online interviews helped me to establish a more real communicative experience with teachers to address relevant aspects pertinently, share material for supporting understanding, or appreciate the participants' attitudinal disposition. Thus, giving information on the importance of including online synchronous communication means in online professional development lessened the absence of face-to-face contact, as envisaged in online professional development programmes (Prestridge and Tondeur, 2016), including Champion Teachers in Chile (Rebolledo et al., 2016).

In the third regard, in the literature review (see section 2.3.1.1, p.43), I described how different action research models (Elliott, 1991; Kemmis & McTaggart, 2000; McNiff, 2005) facilitate teachers' work by giving work a sense of direction, and how collaboration and reflection are integrated features for the construction of meaning, solving problems of practice, or developing research skills (Prestridge & Tondeur, 2016). Findings suggested that the action research framework in the Wiki project gave teachers the possibility to organize their ideas systematically, engage in reflective activities on a weekly basis, share ideas both with me and others, engage in social practices with teachers and students in schools, or receive orientation for supporting their research work, among other possibilities. Here, the feasibility of accessing material, communicating ideas, managing timings, reflecting, and collaborating at a distance, as the literature confirms (McNiff, 2013; Prestridge & Tondeur, 2016; Burns et al., 2016; Mann & Walsh, 2017), emerged through the ways in which the teachers used emails, wikis, and online discussions. This means that, for the mediation of professional development processes in online action research programmes, technologies should (ideally) guarantee fluidity to communicate ideas within a framework that supports order and direction. More importantly, this fluidity needs to converge on the uses of various technologies for creating an integral learning experience that supports individual interests, technological skills, and positive attitudes toward technology use through diversification. Findings in this study suggested that emails, online interviews, and wikis mediated professional development processes within an action research framework, although the uses of wikis did not work for collaboration between teachers, as further expanded in section 7.2.2 (p.216). The implications of these findings suggest that it is necessary to include additional group communication channels and that perhaps a face-to-face group meeting or an online group conversation can reinforce collaboration and its value.

A key finding in this study suggests that collaboration manifested itself through teachers' collegial comments and actions conveying respect and support in the problem-solving wikis. This finding is important for this study because it illustrates the primary approaches that teachers adopted to collaborate with others remotely and sheds light on the dimensions that collaboration can adopt in a wiki. Importantly, this finding demonstrates that technology mediated social interaction and its cognitive manifestations during collaboration. Firstly, I argue that collegial aspects of respect towards other ideas in wiki contributions were a natural practice emerging from the social practice

of professional development. Here, teachers' profiles stressed collegial relationships with others while presenting and representing the *implicit* and *explicit* dimensions of the practice of teaching (Wenger, 1998). These included features of the school context and realities or specific jargon like pedagogical practice, supportive environment, students' performance, therefore resonating with the teaching profession and generating a respectful tone in discussions. Secondly, in the literature review (see section 2.2.1, p.36), I reviewed Little's (1990) dimensions of collegial relationships. Considering these dimensions, I noted that three teachers shared their experiences on aspects of their practice in the wiki, thus conveying information about their ways of teaching, methodological approaches, and classroom tips (see excerpts 6.2:8, p.180 & 6.6:10, p.188). I also realized that Fernanda and Camila searched for aid and assistance by introducing their needs in the wiki or through direct requests in emails (see excerpt 6.7:9, p.190 and Camila's email extract 5, p.145). Camila also shared videos, material, and websites (see excerpt 6.3:3, p.182). Interestingly, none of the teachers engaged in joint work as proposed by Little (1990) by setting goals together, sharing responsibility, or working together to achieve a goal. This finding suggests that the collegial features that the teachers manifested did not involve major coordination for joint construction. All in all, this suggests that this group of teachers approach collaboration as a way to support others collegially but do not construct with others, as further expanded in section 7.2.2 (p.216). Broadly, the above findings demonstrated that technology mediated social interaction and forms of collaboration; thus, mediation manifested itself first between the teachers at an "*interpsychological"* level, through the creation of their profiles, the sharing of material, or basically social interaction in the wiki, and then at an individual or "*intrapsychological"* level to generate concepts, meaning, ideas, and interpretations leading them to interact in more respectful and collegial ways (Vygosky,1978: 57). I expand on mediation in section 7.2.1 (p.213).

Finally, there was an interesting finding concerning the teachers' collaborative uses of tools (e.g. CV, lesson plans, photos and websites) while interacting with me in emails and with others in wikis and the negotiation mechanisms that these tools triggered in both emails and wikis. In the first regard, findings suggested that teachers used tools to share information with me about aspects of professional practice, working context, and professional experiences, clearly stating why they did. In the wiki, tools like photos and website links were introduced with the purpose of clarifying understanding in others and informing others about aspects of practice to support individual

arguments. This finding is interesting because it shows how *explicit mediation* (Wertsch, 2007) promotes multiple negotiation processes. Here, since teachers use emails with a clearer purpose, I argue that this tool becomes a clearer *object of negotiation* (Dillenbourg & Baker, 1996) regarding what to do because the participants state their reasons for sharing. While in group interaction, even if the purpose of sharing is stated clearly (e.g. Excerpt 6.4:22, p.183), it tends to change because it evolves throughout the interactions and is understood in relation to the context of the activity, the individual perceptions of people, and other participants' comments about the tool; thus, the object of negotiation adopts further properties. Findings about the negotiation mechanisms triggered by tools are further expanded in section 7.2.2 (p.216).

7.1.3 Reflection

In the theoretical framework of this study (see section 3.4, p.84), I argued about the relationship between reflection and collaboration by suggesting that when a person collaborates, they are recurrently thinking about what to communicate in a decision-making process informed by reflective practice (Cooney, 1999; Fool, 2007). I also suggested that reflective practice and collaboration moved forward teachers' learning by giving meaning to their actions, intentions, and attitudes; therefore, reflection and collaboration are mutually connected in one way or another (see p.85). A key finding in my study suggests that teachers' reflective processes were recurrently affected by other teachers in The Wiki Project, teachers' research participants, and colleagues' actions at their schools. This observation became apparent in the reflective interviews, when the three teachers acknowledged the impact of the others when presenting their ideas (see pages 167, line 22 and 157, line 20), or when Danitza shared her reflections outlining the impact of Patricio and Roberto on her comments (Danitza's email extract 3, p. 166). First and foremost, this finding shows the interconnected and fruitful relationships of both aspects, as Kostiainen and colleagues (2018) outlined in a pre-service programme in Finland, where the student teachers became more mindful about the impact of others in their learning and more able to express emotions and engage in collegial relationships of mutual respect and support. In this respect, I argue that the main benefit of this relationship in The Wiki Project manifested itself through self-awareness to improve aspects of practice for the future, changes in attitudes toward collaborative work, and understanding with respect to new ways of doing. Therefore, this means that professional development in The Wiki

Project manifested itself through teachers' attitudinal changes and actions involving collaborative work.

I also believe that this mutual relationship was stressed by the action research framework which explicitly promoted reflection as the *reflective enterprise* or backbone of understanding (Mann & Walsh, 2017), or as proposed by the models of Elliott (1991) and McNiff (2005) where reflection is recursive and iterative across all research stages. Here, it is critical to consider that when teachers are working in online-supported action research, especially if it is their first time, it is necessary to be explicit about the benefits and inter-connections of reflection and collaboration. Otherwise, the unlimited creativity, connectivity, communicative potential, the possibilities to control one's timing, and the feasibility of creating products together remotely as various authors outline (McNiff, 2013; Prestridge & Tondeur, 2016; Burns, Westmacott, & Hidalgo, 2016) could remain as positive aspects of technology use, hence preventing a more transcendental professional development understanding of what technology is triggering. That is to say, the understanding that it was through collaboration and reflection in online environments that teachers developed professionally, with technology being a practical, supportive, and facilitating mediational tool only.

In the literature review (see section 2.2.2, p.38), I presented the levels that reflection adopts, ranging from the description of experiences to more critical approaches that involve criticising oneself, drawing parallels, expressing emotions, or acknowledging socio-cultural considerations to assess facts in a more integral way (Hatton et al., 1995; Valli, 1997; Kreber et al., 2000). Findings in this study suggest that teachers adopted different levels of reflection which were mediated by emails, the wikis, and online interviews. However, the key findings are not related to the reflective level of the teachers but to how these levels were affected by the impact of others. This is shown in Danitza's and Camila's contributions in the wiki while explaining their ideas to their colleagues. Here, they addressed personal experiences, experiences of others, feelings, and comments on social situations affecting the teaching profession in Chile, like the impact of MINEDUC policies or curricular adjustments in today's education, thereby reflecting critically to convey understanding to others. Findings also suggested that the levels of reflection in teachers' interactions were related to their personal qualities. For example, Camila manifested her *reflexivity* (Bolton, 2010) recurrently over the project. In the problem identification stage, she situated her

problem in time and space, outlined benefits and challenges, and provided evidence by moving away from the practical problem description. Later on, in the evaluation stage, she adopted a central role to understand how her actions affected the perceptions of others. This finding is interesting because it confirms one of the premises of this dissertation: the multifarious and procedural nature of professional development, which I argue dictates levels of engagement with thinking. These levels include, for instance, mindfulness and empathy in understanding situations from one's own experience. But more importantly, they involve the unconscious internalization of reflexivity into daily practices (Claxton, 1999), thus converging into its natural application for informed decision-making, relevant approaches to learning, professional dialogue, and agency for learning –i.e. *reflective practice* (Schön, 1987).

Finally, an interesting finding in this study suggested that Danitza's levels of reflection were mobilized by reflective strategies based on narrative activities and thinking questions that caused her to adopt a more emotional and reflective attitude. This finding supports Hall's (2018) claims that, by introducing a reflective framework into teachers' work, it is possible to change instructional beliefs, as Danitza stated in her reflective emails when describing her new attitudes to teaching. The implication of these findings is that reflection can be stimulated to become a practice over time; nevertheless, I agree with Mann and Walsh's (2017) warning that we should be cautious about turning reflection into a technique that can be trained in terms of stages given the risk of "going through the motions" without internalizing its value. More importantly, I argue that reflection in professional development programmes (both online and face-to-face) needs to be approached naturally through constant questions and inquiry into what a person is doing and why.

Interestingly, findings also showed that contextual conditions in both online and face-to-face settings supported and limited communicative opportunities for expressing emotions and personal values and reflecting. This finding was clearly observable in Danitza's face-to-face narrative activities when she revealed emotions and feelings regarding the teaching profession and in her last interview when we could not engage in more emotional terms due to several interruptions. In addition, the fact that teachers did not turn on their cameras and interviews took place late at night (as in Fernanda's case) affected their levels of engagement with me, leading teachers' narrations to become conversations with me. In my view, this suggests that technology offers possibilities

and challenges for engaging teachers in more personal, reflective, and emotional forms of remote communication, with interruptions, time differences, and the decision to leave cameras off creating subtle barriers that make it harder to perceive teachers' inner voices loudly (Chase, 2005).

7.1.4 Participation in social practice

In the theoretical framework (see section 3.2, p.74), I argued that professional development was a social practice. This means that people (such as teachers) become meaningful to each other through their everyday life relationships and actions, in a trajectory of participation (Wenger, 1998, Dreier, 1999; Rasmussen, 2005). An important finding in my study showed that action research and the various professional development activities allowed teachers to engage in *action* and *doing* whilst *negotiating meaning* during their participation (Wenger, 1998). First and foremost, this *action* and *doing* in social practice enabled teachers to express their values of guidance and support towards their students or colleagues, –as Camila's emails revealed– by sharing ideas about respect, democracy, and justice. Later on, these teachers also applied those values: while Fernanda supported colleagues during her implementation, Camila did not impose training on colleagues, but gave them freedom to decide, suggesting democratic and respectful professional actions. I argue that these values emerged naturally when teachers satisfied their neglected professional needs in the social practice created by action research (McNiff & Whitehead, 1996). This discovery is especially relevant regarding the impact of action research on teachers' professional development. I believe that teaching is an ethical profession that is expressed by working on the education of other human beings; therefore, teachers' intrinsic desire to satisfy their neglected needs recurrently can be fulfilled within the boundaries of their profession through actions and adjustments to their local professional context by appropriating socio-cultural artifacts for meaning making. This demonstrates that teachers are never "free-floating agents" (Dreier, 1999:6) and that action research and professional development activities provide good grounds to situate their values in context.

In this line of argument, findings revealed that contextual aspects (e.g. national holidays) conspired against Fernanda's implementation and kept her from conveying her values of support and democracy to her students. This finding is interesting because it suggests one of the many aspects

to consider when implementing action research projects in either a local or an international context. In this regard, a few local studies, action research reports, and projects (Rebolledo, 2013; Smith et al., 2014; Burns & Westmacott, 2018), have addressed challenges such as a lack of time, experts, and educational policies. I argue that the main challenge in The Wiki Project was finding pertinent times and opportunities for coordinating teachers' synchronous work with me, both due to their busy lives and tight school schedules.

Research Question 2

7.2. How do collaboration and collaborative practices manifest through the process of professional development of teachers working in a wiki?

7.2.1 Mediation

In the literature review (see section 2.4.3, p.56), I referred to the main multimedia possibilities that wikis provide for the expression and interaction of ideas remotely (Biasutti & EL-Deghaidy, 2005), although I described varied wiki features such as remote access, easy accessibility, economy, and the possibilities to track and edit comments over time (Mansor, 2012; Brox, 2017; Google, 2018). I argue that wikis' interactive and collaborative potential, asynchronous interface, and user editing tools were critical for the collaborative activity of the teachers in the problem-solving wiki, therefore, it is pertinent to start by discussing my findings regarding the possibilities and challenges of wikis vis-a-vis social interaction; then, I will refer to my findings regarding collaboration and collaborative practices with broader considerations in mind.

A key finding in my study suggested that the social and problem-solving wiki mediated professional development processes by opening spaces of socialization, reflection, and negotiation of ideas between teachers. From the socialization angle, teachers in the social wiki projected their intentions to collaborate and engaged in social practices to express commonalties, praise ideas, and satisfy their need to know something about others, as discussed in section 7.2.2.1 (p.217). Here, my findings demonstrated that the various online professional development activities offered gave teachers the possibility to work within a professional development context created through

their interactions in social practice. In a sense, these activities represented the social context for the mutual construction of understanding through interaction (Engeström, 1990), where teachers negotiated ideas, socialized, and reflected through mutual relationships among subjects, objects, and artifacts. More importantly, working in a wiki supported the construction of a new context with others, as mentioned in section 7.1.1 (p.202). For example, members of the technology team made several claims about technology and its dangers and MINEDUC regulations, which situated the discussions within broader socio-cultural perspectives, suggesting that teachers acknowledged social, political, and cultural perspectives and created spaces to include those perspectives in the wiki. This finding is particularly relevant for this study because it illustrates how the construction of context (Van Oers, 1998) in online environments transforms simple interactions into a professional development reality, hence supporting my ontological claims (see 4.1.1, p.90) that professional development is an act of social construction with others. More importantly, this also demonstrated the mediational potential of the wiki, previously commented in section 7.1.2 (p.204), for granting teachers possibilities to develop twice (Vygotsky, 1978): first in the social plane created through their interactions, material sharing, and comments, and then through the appropriation of tools, methods, actions, and functions that already exist in a given culture for their learning (Ivic, 2000). Here, interaction at an *interpsychological* level gains particular significance when the person is placed at the centre of the social plane through social interaction in heterogenous groups (Lai, 2011). For me, when a teacher becomes an active articulator in the zone of proximal development (Vygotsky, 1978), learning and development can occur, as demonstrated in interactions of the technology and methodological teams.

Regarding reflective practice, findings demonstrated that the asynchronous interface of the wiki allowed teachers time for thought and reflection. A clear example was Camila from the technology team, who added one contribution at different times (see figure 6.5, p.185), which could include commenting while having breakfast or during her baby's sleeping time. This finding supports research literature (Pratt & Palloff, 2007; Brox, 2017; Hall, 2018) on the convenience of asynchronous online environments (e.g. blogs, discussion boards, or email) for working at one's own pace thus allowing extra time to think and edit comments freely. However, the wiki, due to its asynchronous nature, also promoted lapses of interaction that were particularly evident in members of behaviour team (see Excerpt 6.6, p.188), leading them to interact mainly with the

problem presented rather than with the ideas of their colleagues, and preventing teachers from engaging in "synchronicity of reasoning" (Dillenbourg, 1999:99) through their interaction. This finding encourages us to consider the attitudinal, contextual, and time factors affecting opportunities to contribute in a wiki. This was noticeably low in teachers from the behaviour team and in Carolina and Patricio from methodology team, ranging from 2 to 4 contributions in total. To support this argument, findings suggested that the length of contributions, especially noticeable in Camila and José from the technology team and Patricio from methodology team, demonstrated that the wiki looked saturated, was overwhelming to read, and made it difficult to follow the ideas, despite the uses of punctuation and paragraphs. Here, Bustamante and Moeller's (2013) study supports my findings that extended contributions in a wiki can affect motivation to interact, since it is perceived as tedious. Based on this containing evidence, I would argue that delays in replying or (simply not replying) and some visually saturated contributions could have affected teachers' motivation to interact to a certain degree in the teams, hence promoting barriers for negotiation of ideas in the wiki.

Finally, findings suggest that Google Docs' wiki editing tools facilitated collaborative practices of negotiation by helping teachers create context, generate clear references, and give clarity to their ideas. I have already mentioned that teachers created new context through social interaction while commenting about socio-cultural perspectives affecting teachers in Chile. I argue that Camila's uses of hyperlinks and photos with educational information supported the creation of context for interaction in members of her team as well. Mainly, I also noted that resources opened possibilities to agree or disagree, hence supporting negotiation practices as further discussed in section 7.2.2.2 (p.220). The use of numbers –ordinal and cardinal, parentheses, capital letters, quotation marks, and embedded comments– acted as mechanisms for *making references* and addressing ideas with more clarity in the wiki, this being a critical aspect for negotiation to happen (Azmitia, 2000; Mercer & Littleton, 2007). These tools allowed teachers to organize their ideas within their comments, add comments without affecting the content of their ideas, and emphasise some words or concepts that they wanted to highlight; also, Camila addressed specific aspects relevant to her in the discussion, which I argue could have become lost in the extended contributions. Although these uses are not unique to a wiki, it is useful to highlight the mechanisms that teachers adopted to convey meaning in the absence of physical contact.

7.2.2 Collaboration and collaborative practices

I defined collaboration (see section 3.3, p.76) as a social situation taking place in a socio-cultural context, a context which is constructed through the mediational framework of language (in this case, written language), tools, people, and the activity (Roschelle & Teasley, 1995). In essence, I suggested that collaboration can be considered a state and process (Brna, 1998) where people interact in asynchronous and synchronous ways to achieve a goal together through coordinated efforts; hence, collaboration involves an act of mutual construction over time (Dillenbourg, 1999). A key finding in this study suggested that the emergence of strategies to seek solutions to the problems in the wiki did not happen in collaboration through joint decision-making between the teachers, but through teachers' individual ideas shared to support others, with collaboration adopting collegial dimensions to demonstrate support and respect between themselves. This became evident in the three teams, especially in the behaviour team where teachers added contributions to give direct advice but without making explicit references to others for negotiating future ideas (see Excerpt 6.6, p.188 and Excerpt 6.7, p.190). Although members of the technology and methodology teams made references recurrently and more tacitly and engaged in building trust and negotiation processes (see Excerpt 6.2, p.180 and Excerpt 6.8, p.193), the joint construction of strategies did not happen either. Here, findings showed that negotiation processes faded due to the length of the participants' interactions, the limited participation of some teachers, or the attitude of others (such as short replies or no replies to questions). In consequence, no further agreements, disagreements, or consensuses were generated leading to the creation of a strategy for dealing with the problematic situation. The fact that collaboration in the constructive sense of the word did not happen in the wiki is congruent with research studies and reports (Chan, 2011; Brass & Mecoli, 2011) describing the attitudinal, technical, and contextual challenges involved in engaging teachers in collaboration in wiki-based platforms. In this regard, theoretical developments (Dillenbourg & Baker, 1996; Salmon, 2000; Garrison et al., 2009; Crook, 2011) and empirical studies (Lai & Ng, 2011; Prestige & Tondeur, 2015; Hall, 2018) provide some interesting insights into some components that worked well for the joint construction of ideas or artifacts (e.g. lesson plans, teaching resources) with others online. These broadly involve promoting collegial relationships and reflective discussion, granting an optimal space for interaction, allowing people individual agency, and having an effective facilitator, among others. With these ideas in mind, I now discuss

how teachers' collaborative practices occurred in the wiki and produced support for others in collegial terms.

7.2.2.1 Building Trust

In the theoretical framework (see section 3.3.2, p.79), I defined aspects supporting trust-building in online environments and referred to its implications for collaborative activity. There, I suggested that conveying a social presence that speaks about similarities and significant practices for others and informs of an individual willingness to collaborate enables engagement leading to collaboration (Schwartz, 1998; Wenger, 1998; Crook, 2000). My findings in this study suggested that teachers, in their profiles, evidenced various mechanisms aimed at building trust to collaborate, ranging from showing academic and personal features of their professional lives to the expression of collaborative needs and goals as well as positive attitudes to collaborative activity. In the first regard, findings showed that three teachers' profiles projected a more academic and formal image by mentioning qualifications such as M.Ed. degrees, academic goals like enrolling in a Ph.D., and intentions to pursue studies, along with information about their life-career trajectories. In contrast, other teachers portrayed themselves more personally and informally by commenting on hobbies like photography, travelling, and movies, along with personal information about their families. Although I acknowledged that teachers' profile orientations could have been influenced by my sample profile and the influence of reading other profiles, I interpreted these findings from two perspectives. First, teachers with a more academic image, wanted to share similarities as professional teachers and embrace a sense of trust by sharing cognitive resources that informed others about their professional capabilities, skills, and overall pedagogical knowledge for potentially supporting others or creating professional relationships based on affinities or professional *symmetry* (Dillenbourg, 1999). Second, teachers with a more personal and informal image could be interested in exchanging classroom experiences with colleagues outside school with similar affinities, likes, and interests; therefore, these teachers' "focal point of coordinated activity" centred in demonstrating openness and personal affinity as means of building trust (Crook, 2000:176). All in all, this shows that profile creation was dictated by teachers' professional intentions with respect to their participation in The Wiki Project. In this regard, the study revealed that years of teaching experience did not necessarily equate with a more academic or personal

introduction. For instance, Patricio, who had two years of teaching experience at the time of the study, introduced himself to the others in a highly academic and formal fashion. This demonstrated how the social presence of the teachers' *self-projects* into the wiki environment in different shades (Garrison et al., 2007). This happened in the wiki when teachers projected themselves as academics, parents, learners, technology lovers, etc. My point with this idea is to illustrate how teachers' agency (Schwartz, 1998) manifested itself in online environments and affected features of the online personality that teachers projected in The Wiki Project.

In a similar vein, this study suggests that teachers' profiles give information about their collaborative needs and goals regarding collaborative activity, hence shedding light on significant aspects of the teaching profession regarding the need to learn with others. Mainly, most teachers tacitly expressed their intentions to collaborate with others and adopted an interactive attitude by including group greetings in their profiles, while two teachers shared websites showing their willingness to be asked questions. However, the expression of intentions did not necessarily translate into collaborative practices in the problem-solving wiki. This finding is intriguing for me because it replicates findings in my pilot study and made me reflect on the motivations that led people to express their intentions to collaborate in online environments and the mismatch with participation and collaborative practice. Here, Brass and Mecoli's (2011) study provided interesting insight by arguing that the social practice that the wiki promotes could be perceived as less dynamic for teachers, hence affecting attitudinal dispositions that restrict possibilities for interaction, dialogue, and collaboration. I agree with that idea because it appeals to people's individual motivations and perceptions regarding the uses of technology for collaboration. However, I am also inclined to think that the profiles themselves created a professional development context that affected dispositions and attitudes to express positive intentions toward collaboration. This creates what I call a "*collaborative momentum*" triggered by the novelty and initiation of an activity. I argue that this collaborative momentum affected the communal expression of intentions and motivations and demonstrated positive perceptions of collaboration which were expressed in writing, although later this did not translate literally due to participatory, attitudinal, or contextual constraints.

Findings suggest that teachers approached the social opportunity provided by the Hello Group activity to express similarities in interests and refer to aspects of the teaching profession. Here, teachers showed what Crook (2000: 168) terms an "intersubjective attitude" that involved teachers' individual willingness to establish relationships with others by questioning aspects of practice, commenting on relevant aspects regarding their profiles, or by simply establishing first contact by greeting others before the collaborative activity started. In this regard, I argue that the social practice in my profile along with the Hello Group activity facilitated the transition between getting to know each other and collaborative work in The Wiki Project. As reviewed in section 2.4.2 (p.52), Consultant-E and CiSELT online teacher development programmes include similar social activities, balancing the projections of social presence in profiles with opportunities of socialization aimed at supporting engagement for future interaction. I noted that social interaction was limited and concise in the Hello Group activity; also, I believe that the profile activity worked well in enabling teachers to project aspects of what Palloff and Pratt (2007: 202) termed "online personality" in their professional profiles, supporting the projection of an image to contact potential collaborators, express similarities, or satisfy the need to communicate ideas. Regarding the few interactions in the social activity, I noted that delays in the scheduled interview affected to a certain degree the initiation of the social activity, since it had been originally planned to allow teachers more time to get to know each other in a better way. Based on this evidence, I consider that the launch of the problem-solving could have diverted to some extent teacher's attention to collaborative work in their teams, promoting fewer social exchanges in the social wiki. This realization is important because it shows how the challenges in setting up and implementing online professional development professional programmes can trigger the need to adjust time compatibilities of people while designing and facilitating courses. Similarly, it indicates the need to align learning experiences to individual needs, as suggested in studies (Chan, 2011; Hall, 2018;) where facilitators have struggled to engage participants to participate, interact, and collaborate due to contextual or attitudinal reasons. This suggests that, in online professional development programmes, the facilitator, instructor, or mentor needs to adapt to the evolving conditions that the contextual situation imposes, thereby making the most of the professional development experience in an evolving process of accommodation of strategies, restructuring, and creativity to face complications in the best way possible, as expanded in section 7.3.1 (p.224).

7.2.2.2 Negotiation

I have defined negotiation (see section 3.3.4, p.82) as a critical process for collaboration to occur because it unifies understanding between people, for example, for solving a problematic situation in a wiki in a dynamic and productive process of continual interaction and gradual achievement (Roschelle & Teasley, 1995). I also argued that negotiation in online environments would involve a different process than in face-to-face activities; as such, I defined broad stages in the negotiation process to outline clearly what to expect in a wiki, as I presented in figure 4.4 (p.106). Basically, these processes involved people's capacity to articulate individual perspectives (Stahl, 2003), create joint references (Crook, 1999), argue for a standpoint (Dillenbourg & Baker, 1996; Dillenbourg, 1999), and reach consensus (Mercer & Littleton, 2007).

A key finding in this study suggested that, for the negotiation processes to emerge in a wiki, it is necessary for teachers to create direct references through explanatory accounts. For example, negotiation of ideas emerged in a clearer way in one episode of interaction among members of the technology team (see Excerpt 6.4, p. 183). These teachers negotiated their ideas after presenting their perspectives about the role of technology in today's school, to then exchange their views, disagree in ideas, and partially agree in order to reach an understanding. This process led one of the teachers (José) to construct his personal interpretation of the uses of the ICT Matrix in education. First and foremost, to achieve the continuity of interaction and gradual achievement for understanding (Roschelle & Teasley, 1995; Stahl, 2003), teachers made constant references by naming others, using photos, questions, and addressing their ideas directly in an explanatory writing style involving reflections, claims about education, and explanations of situations. For me, this finding is critical to understand the emergence (or not) of collaboration in a wiki because it evidenced the necessary conditions for negotiation to occur (i.e. clear references in an explanatory style of writing that supports the creation of joint understandings of situations). In this regard, Mercer and Littleton (2007) note how alternative views are essential for collaboration by emphasising that, for collaboration to happen, the sources of differences must articulate perspectives that make sense. I argue that negotiation processes in the wiki activity emerged primarily after teachers presented alternative views in the technology team. This suggests that the manifestation of conflict in a wiki can define aspects of negotiation or indicate that a negotiation

process involving repairs, counter suggestions, conceding points, and joint construction of ideas (Stahl, 2003; Mercer & Littleton, 2007), may potentially emerge.

Another interesting finding showed that the role of an active participant that takes the lead in the interaction supports the emergence of negotiation of ideas within a group. This became evident in the technology team, where Camila's actions mobilized negotiation practices in José and Carlo. Here, Hargreaves' (1994) ideas about the positive impact of working with a peer who softens relationships of power for embracing the expression of ideas with more confidence and trust, or de Vries, Van de Grift, and Jansen's (2014) study about the positive perception of teachers regarding working with other colleagues, support claims that working with others affected teachers' attitude to collaborate in the wiki. The implications of these findings caused me to reflect on the affective impact of a teacher with a leading attitude in the collaborative activity and on the actions leading to the involvement of others. Here, I argue that Camila's adaptation of guiding, supportive, and facilitating roles, involving for example, having a constructive disposition to move conversations forward, allowed her to adopt an explanatory role granting other opportunities to think further. More importantly, she applied the wiki to her own contextual situation and communicated her ideas with others (e.g. by adding hyperlinks, making embedded comments, and pasting pictures) which supported moving the team members into a social, cognitive, and affective dimension, supporting what Garrison and colleagues (2007) termed as the learning experience in their framework of community of inquiry model.

Returning to the idea of references, in section 7.2.2 (p.216) I mentioned how photos and hyperlinks aimed at sharing ideas about education granted opportunities for negotiation because these resources opened possibilities to agree and disagree on the content presented. I argue that the uses of tools in the wiki supported the creation of references or, as Mercer and Littleton (2007: 74) claim, the use of resources provides "a shared frame of reference". For me, resources addressed common aspects of the social practice of teaching (e.g. curriculum structure, aims of education) therefore constituting clear references for other teachers. Taking this line of argument, the study showed that references do not necessarily need to be explicit –it is not necessary to name others in a wiki or share photos. References are embedded in the teachers' accounts, which carry ideas about the teaching culture and profession, therefore, an explanatory style of writing that enriches the

ideas presented seems critical for negotiating further perspectives. This happened in Excerpt 6.8 (p.193), where members of the methodology team added personal experiences about the teaching profession and mentioned aspects of the teaching culture, and while doing this, the teachers commented about the ideas of others in an indirect way. Here, *the shared frame of references* (Mercer and Littleton, 2007) emerged after teachers evoked past teaching experiences, leading them to collide in their methodological ideas (e.g. use of portfolios), and in comments regarding contextual situations like school strikes. Interestingly, in the same team in Excerpt 6.9 (p.195), the negotiation processes adopted emotional dimensions, therefore suggesting that comments addressing motivational remarks supported the negotiation of ideas in a wiki. Consider, for example, Danitza's supportive and encouraging comment about Roberto's difficult problem, which then led him to share his feelings of discouragement and discuss actions carried out in that respect. This finding illustrates how the idea of *perezhivanie* (Vygotsky, 1978) works in social interactions, by suggesting that collaboration is not only a matter of people working together for the purpose of joint creation, but it involves a whole socio-cultural framework where cognitive and emotional aspects intertwine recurrently. Crook (2000) captured this by suggesting that collaboration needs to be interpreted in terms of an *ecology* that brings together socio-cultural, affective, and cognitive dimensions. For me, this finding shed lights on the way in which collaboration manifests itself in a wiki. I argue that teachers' collaborative practices, involving building trust and negotiation, revealed that approaches to collaboration are reliant upon both emotional and cognitive support, as practices of respect toward others, advice aimed at giving support, the sharing of material, telling of classroom anecdotes, and requesting help introduced collaboration into their Google Docs wiki in more collegial terms. Thus, collaboration in the constructive sense of the word was not supported in this study; however, it was present in the collegial sense.

7.2.2.3 Division of Labour

I have argued (see section 3.3.3, p.81) for the usefulness of Dillenbourg's (1999) definition of division of labour for my study because it supported my understanding of approaches to collaboration in a wiki. There, I outlined two main approaches: a horizontal division of labour, suggesting that people adopt roles and coordinate efforts recurrently to achieve a goal, and a

vertical approach to division of labour whereby people adopt rigid roles to fulfil a task from the beginning, therefore requiring less coordination and an inclination toward individual performance. The latter approach is associated with the idea of cooperation (Brna, 1998; Kirschner et al., 2004; Murphy 2004; Stahl, 2006). A key finding in this study suggested that contributions giving advice on what to do without clear references to others (e.g. in ideas, without names, or by addressing broader socio-cultural situations) did not facilitate the emergence of negotiation practices, mainly because direct advice embraced a vertical division of labour approach to collaboration (Dillenbourg, 1999) that manifested itself through direct and individual support for the solution of a problem, and where roles in collaborative activity were not negotiated by the teachers. This became evident in the interaction of the behaviour team (see Excerpt 6.6, p.188 and Excerpt 6.7, p.190), where teachers added advice only based on their personal experiences with no explicit references to others, as a primary approach to seek solutions to the problem presented. This finding is interesting due to the implications for giving direct advice imposed on negotiation process leading to collaboration. I argue that giving advice encourages participants to pay attention to the individual performance of the person making a contribution: fewer possibilities to make joint decisions, a fixation on the range of possible action of the receiver of the advice, and barriers to engage in the achievement of common goals (Dillenbourg & Baker, 1996; Dillenbourg, 1999; Mercer & Littleton, 2007). For example, Claudio advices engaging with parents (see Excerpt 6.6: 23-24, p.189), but his comments become a mere description of actions, such as creating a school code of practice, giving parents a document for them to sign, so it acts as evidence of the parents' commitment. There, his comments did not reflect further socio-cultural considerations, hence also restricting the space of negotiation (Dillenbourg & Baker, 1996). I also argue that direct advice can be perceived as an imposition, therefore, the asymmetrical opportunity for negotiating perspectives is restricted to what is said and argued as valid.

The relevance of this finding has several implications for professional development in online environments. An important one relates to the way teachers perceived the collaborative activity. In the literature, several authors have suggested that collaboration takes time (Little, 1990; Hargreaves, 1994), but more importantly, it requires an understanding of the concept itself, which could have not been fully supported by the research design of The Wiki Project, including information material, instructions on what to do in the wiki (see section 6.3, p.177), and my

explanation of collaborative work in the face-to-face conversation. Therefore, I suggest that it is critical to reinforce teachers' understanding of collaboration, perhaps, by giving practical examples, showing videos, and reading articles with a focus on the importance of collaboration to further engage teachers in the process in a more informed way. A second implication suggests the need for a balance between advice based on personal experiences and contributions presenting explanations of ideas as support when it comes to contributing in a wiki for collaboration purposes. For me, instructing teachers about the importance of explanations may not only be a good basis for collaboration in a wiki, but may also support community building (Wenger, 1998) by embracing partnership practices rather than offering direct advice for support; emotional investment toward solving a problem together instead of providing individual solutions; trust by leading teachers to understand ideas broadly, and not necessarily from a one-sided perspective; and risk taking, which leads teachers to have a better ground to ask questions and learn with others (Day, Hadfield, & Kellow, 2002).

Research question 3

7.3. How do teachers approach support, guidance, and facilitation in the professional development experience?

7.3.1 Support, guidance and facilitation

In this study, I adopted an insider positionality (see section 4.1.5, p.97), although tensions emerged constantly while not influencing teachers' decision-making process. My findings in this study suggested that teachers approached my various roles in accordance to their professional and academic needs, therefore, different manifestations of collaboration emerged in our relationships. I consider that to understand these relationships in an informed and pertinent way, some parallels with professional development literature (see section 2.3.1, p.41) highlighting the role of others (e.g. an expert, a peer, mentor, critical friend, and facilitator) could shed light on the perceptions of the teachers regarding support, guidance, and facilitation in The Wiki Project and their links with the collaborative activity that it involved.

Historically, the role of an expert has involved supporting teachers from a hierarchical position by delivering contents and instructions, with teachers becoming recipients of information (Kumaravadivelu, 2012). In the information stage, I noticed Danitza being unreceptive towards my comments, thus imposing some barriers for communication. For me, this showed Danitza's initial perception about my role in The Wiki Project, perhaps as an expert in action research, which made it difficult for me to ensure verification of ideas (Vygotsky, 1978) and further communication regarding the information provided (Schwartz, 1998). All in all, the suggestion to adopt asymmetrical roles in communicative and collaborative situations does not optimize the emergence of interactive opportunities (Dillenbourg & Baker, 1996). I also noticed that teachers could have perceived my role as a critical friend (Elliott, 1985; McNiff, 2013). For me, Camila's inviting attitude to engage in collaboration with her through the sharing of material, professional decisions, and comments in emails inviting others to contribute with alternatives, feedback, and companionship was evidence of that. In this regard, I also consider that Camila's inquiries about aspects of my research were a manifestation of her perception of my role as a critical friend for support, and from where I could provide insight on important aspects of academic practice by sharing my experiences. Mainly, I argue that Danitza also embraced those perceptions when sharing her reflections with me, thereby opening her thinking to my potential feedback and support on her developmental process. All in all, these teachers' actions demonstrated that the coordination of efforts recurrently led to the creation of a *collaborative state* between us over time (Brna, 1998). Finally, I also noted that Fernanda saw me as a peer-colleague from whom she could request direct material and ask questions about aspects of her practice. Although I acknowledge that this peer role is critical for professional development, her receptive position toward my support and her actions in that respect prevented collaborative relationships further by not opening spaces of interaction, and caused my inquiries to become fixed, instead encouraging a more vertical division of labour (Dillenbourg,1999) by requesting that I mostly supply her with materials. My point with these examples is to illustrate how teachers' dispositions and actions toward my various roles, which I argue were dictated by their specific needs, defined our collaborative relationships in The Wiki Project, i.e. demonstrating that collaborations are social events (Crook, 2000) which manifested themselves through a mutual inter-relationship that defined the collaborative boundaries in terms of disposition and actions. These dispositions and actions meant that we communicated in more collegial dimensions involving aspects of support, respect, and trust. This

became evident in the three teachers through their messages of gratitude, sharing of material with me, and open attitude to share their concerns and express their needs; for me, it also suggested how collaboration and collegial aspects reflect one another (Kelchtermans, 2006), merge recurrently, and adapt to the contextual conditions of the professional development situation.

I have defined the role of a facilitator (see section 2.4.2, p.52) in reference to Garrison et al.'s (2007) communities of inquiry model. There, I outlined his/her role in two regards: the facilitator's responsibility to structure the learning experience and the delivery of the contents for facilitating collaboration and reflection. The Findings suggested that teachers adapted to facilitation in different ways: while some teachers acknowledged my contributions and interacted with me, other teachers seemed to ignore my comments or address my questions in indirect ways, showing our detachment in collaborative relationships. In the first regard, teachers in the technology team approached facilitation naturally, a fact I attributed to the collaborative state (Brna, 1998) that members of this team adopted, including a disposition to support others and act accordingly. This collaborative state demonstrated that my managerial skills adapted to their mode of working, supporting their understanding from a more symmetrical relationship; for example, by guiding their development, supporting the flow of interaction, or instigating cohesiveness (Collins & Berge, 1996) I participated in the social practice of professional development as one of them. More importantly, this showed that I had changed my inquiring and supporting attitudes naturally (e.g. fewer questions and more examples), therefore, I was more open to learn new perspectives as well (e.g. about technology and education) and adapt to their needs which in turn became part of my learning to support these teachers' projects. However, when interactions did not flourish, as in the behavioural team, I noticed that my attitudes also focused on supporting mechanisms like sharing videos, stating of opinions, and asking questions, which did not necessarily support collaboration in teachers or the adaptation of new attitudes, dispositions, and roles in them.

My professional practices evolved and changed throughout The Wiki Project. First, email technology emerged as an effective alternative for communication and collaboration with teachers for sharing materials, addressing problems of practice and their possibilities, and sharing reflections, among other uses. Here, my practice evolved gradually while creating meaning (Wenger, 1998) based on the professional context that emails were opening and hence enabling me

to understand teachers' concerns. Emails also encouraged emotional engagement through the sharing of reflections, the addressing of specific needs, and direct communication, thus promoting a one-to-one channel for the expression of collaborative intentions and the building of trust. Finally, emails promoted the creation of direct and focused references regarding teachers' problems. This supported aspects of productivity while providing information directly, for example, through hyperlinks or specific material. In a sense, email technology became the primarily link for communication and doing for teachers like Danitza and Camila, while for others like Fernanda, it opened a space of support and guidance. For me, this is clear evidence of the potential of this tool for co-construction and stresses the importance of understanding its possibilities and challenges in professional development opportunities like The Wiki Project or Champion Teachers and in programs where physical contact seems limited to orientation and motivational stages.

Second, my practice as facilitator in the wiki changed regarding my uses of questions as the primary approach to generate interactions leading to collaboration. The awareness that teachers were not engaging in collaboration through my questions caused me to complement my question-based strategies with the presentation of summaries, explanations, and examples, among other features. Hence, I moved from a more inquiring approach to a more explanatory one, where teachers addressed their needs and interests plainly. Here, I learnt that my questions were in a sense restricting the scope of teachers' ideas, because teachers were focusing on answering my inquiries, whereas when my questions were broader (see excerpt 6.10:4, p.196) or complemented with additional material (see excerpt 6:10:19, p.197), explanations, or examples, teachers were more likely to expand their ideas further, thus presenting a professional development context based on their comments rather than mine. As such, my learning involved understanding that my primary role as facilitator consists in providing opportunities for explanations in a wiki, rather than simple interactions in my attempt to generate comments leading to collaboration. This is relevant in a Chilean context, where research on wiki technology seems restricted (see section 2.4.4. p.61), especially when wiki uses emerged gradually as strategies for collaboration outside of the formal class or developmental opportunity.

The implications of these findings invite us to reflect on the pertinence of the moderation strategies that I applied and the importance of changing attitudes and roles in collaborative activities both

for the facilitator and for the teachers to collaborate. Regarding the relevance of my strategies, I believe that my questions, summaries, videos, and statements of opinions started and sustained episodes of interaction in the teams, by encouraging teachers to display descriptive, explanatory, and clarifying attitudes. Here, it is important to consider that the Google Docs wiki led teachers to work in a less structured and orderly manner (i.e. teachers needed to scroll down to reply pertinently by creating clear references). Therefore, there was a different set of moderation skills required for weaving contributions, linking, and summarising ideas or broadly demonstrating cohesive interaction. This idea is aligned with studies (Collins & Berge, 1996; Salmon, 2000; Lai & Ng, 2011) that show the necessity to adopt different facilitator/moderator roles depending on the nature of the platform and the profile of the participant. Hence, I learnt that my main role as facilitator in the Google Docs wiki consisted in ensuring that teachers diversify and make the most from the roles adopted in problem-solving activity, thereby learning meaningful practices for their teaching and learning practices from such interactions. Therefore, it is essential to adopt an active attitude and diverse facilitator roles in Google Docs wikis, because losing or enhancing collaboration is inexorably attached to the manner of such collaborative activity.

Summary

In this chapter I have discussed the findings of The Wiki Project regarding the technology potential for mediating professional development processes of teachers across Chile with a focus on their collaborative activity in a wiki, along with discussing aspects of guidance, support, and facilitation within teachers' projects and the collaborative dimensions involved. I also presented insights into the evolution of my practice, which is pertinent for my action research methodology design. I have argued that technology introduces challenges and possibilities for mediating the professional development processes of collaboration and reflection in a Chilean context. Here, schools' context, teachers' individual attitudes, and participation structures hindered or facilitated aspects of professional development dimensions. First and foremost, I have suggested the need to approach technology use pertinently by including multiple channels of communication for teachers to interact (including face-to-face alternatives) so that technology does not become a compulsory or rigid part of teachers' development, but a supporting and useful component for connectivity, learning in collaboration, networking, and sharing resources, among other possibilities (Hennessy et al., 2016).

In the wiki collaborative realm, I have argued for the need of a balance between explanatory contributions to support the understanding of problems and provide direct advice in descriptive ways to enable the negotiation processes to flourish, leading to collaboration in a wiki. Here, I have also pointed out that teachers in this study tended to adopt collegial approaches to collaboration informed by respect and support. This approach emerged from the practice of professional development itself, however, it did not manifest itself in joint construction (Little, 1990), thus indicating a mode of interaction dictated by a vertical division of labour. This stresses the relevance of reinforcing an understanding of collaboration and uses of technologies in teachers before engaging in collaborative activities online. Lastly, I discussed aspects of my learning as facilitator by considering my relationships with the teachers, highlighting that the main role of the facilitator consists in diversifying and making the most of teachers' roles in collaborative activities in the Google Docs wiki. Mainly, I discussed how my practice evolved in terms of my uses of email technology and my approach to asking questions in a wiki, after understanding the barriers and possibilities that emails and questions introduced into co-construction. In the next and final chapter, I present the conclusions of this study.

Chapter 8: Conclusions

Introduction

In this chapter, I present an overview of the study with an emphasis on its main goals, rationale, and research processes. I also present an overview of the key findings in relation to the main research questions, discuss its contributions to knowledge, and its implications for practice by addressing contextual, collaborative, reflective, research-based, and facilitating aspects of online professional development. This chapter concludes with a discussion of the study's strengths, limitations, and recommendations along with my final reflections on my professional development and its links with this research.

8.1 Overview of the study

This study explored the mediating role of technologies in the professional development process of eleven primary and secondary school teachers across Chile, with a focus on their collaborative practices in a wiki. I also explored aspects of my professional practices through our collaborative relationships during the professional development experience. To do this, I designed, crafted, and implemented a professional development programme that I termed The Wiki Project (see section 4.2, p.99). This project was part of my action research strategy to examine Chilean teachers' professional development in online settings. Therefore, it served the purposes of supporting teachers' professional development processes, gathering data regarding those processes, and understanding aspects of my professional practices through our relationships. My main intention with this study was to find answers regarding the possibilities that technologies can bring to professional development with a focus on collaboration. This was important for me due to the collaborative constrains that had affected my own practices as a teacher educator; for example, difficulties in encouraging participation, commitment, and collaboration in online professional development programmes. Therefore, this study originated from my professional experiences, the same experiences that led me to adopt an action research methodology to pursue this research project.

Three research questions framed the nature of this inquiry;

1. How does a technology-enhanced action research opportunity mediate the process of teachers' professional development?

2. How do collaboration and collaborative practices manifest through the process of professional development of teachers working in a wiki?

3. How do teachers approach support, guidance, and facilitation in the professional development experience?

These questions were relational, that is to say, they supported an understanding of professional development and collaboration in online environments by taking our (teachers' and my own) communal actions into consideration. An action research methodology (see figure 4.2, p.94) supported the answering of those questions through my engagement in cycles of action-reflection over a period of time. First and foremost, thematic analysis (Braun & Clarke, 2006) and interaction analysis (Jordan & Henderson, 1995) frameworks provided appropriate support to explore the processes of professional development and collaboration by considering trajectory and interactions as the basic units of analysis.

8.2 Overview of key findings

1. How does a technology-enhanced action research opportunity mediate the process of teachers' professional development?

Findings in this study showed that technology introduced possibilities and challenges for mediating the professional development processes of teachers' problem-solving in their remote practices. From a positive side, technological mediation opened spaces for social interaction leading to reflection and collaboration while also giving teachers the opportunity to express and put into practice professional values in a professional context. Here, the local school context granted possibilities as well as challenges in this mediated process. The former manifested themselves through school support (e.g. permissions, resources, support from school colleagues) and through teachers' overall positive attitude and interest in working online. For its part, the latter

resulted from the inexorable time restrictions imposed on teachers' work by extra-curricular activities and school holidays, thus demonstrating that the context had a major impact on teachers' professional development experience. By contrast, technological mediation did not work well for all teachers, highlighting the need for contextual and direct support and the emergence of professional attitudes to communicating online, which fostered interruptions in communication and gaps in participation. All in all, this suggested the need to use technology pertinently by including different channels of communication for teachers to interact face-to-face (ideally), so that the use of technology does not become a compulsory or rigid part of teachers' development.

Teachers in this study adopted a collegial approach to collaboration in their online encounters in a wiki, which manifested itself through a respectful and supportive attitude to their colleagues, although collaboration through the joint construction of strategies for problem-solving in a wiki did not happen. In this regard, collaboration happened in email and online as well as in face-to-face interviews with me, which suggests that different patterns of collaboration are appropriate for certain technologies, that it is critical to mix technologies for promoting better engagement in collaboration, and that my role is essential for the development of their projects. Reflection manifested itself at several levels in The Wiki Project (e.g. more descriptive or critical), being dictated by teachers' personal styles and professional trajectories, which I argue affected their level of engagement with their thinking. In this vein, the study showed the importance of reflective strategies (e.g. thinking questions, narrative activities) for supporting reflective intents in teachers, although contextual situations (such as frequent interruptions, cameras being switched off, late-night interviews) limited engagement in more personal, and perhaps more emotional and self-reflective terms, thus indicating the possibilities and challenges that technology can represent for engaging people in more personal, reflective, and emotional forms of communication at a distance.

The study also showed how collaboration and reflection worked in a mutual relationship. This was demonstrated by teachers reflecting on the impact of the other person recurrently, either in emails, online interviews, and wikis. Here, the action research methodology and professional development activities acted as a good framework for supporting processes of reflection and collaboration at a distance, giving teachers possibilities to support other colleagues with advice, engage with their thinking through reflective tasks, contact others for support, access material, and express their

values while engaging in the social practice of professional development. For me, this supports my claims in the introduction of this study (see section 1.5, p.22) that a flexible, approachable, and realistic action research approach is important for meeting the professional demands of Chilean teachers today.

2. **How do collaboration and collaborative practices manifest through the process of professional development of teachers working in a wiki?**

Findings in this study demonstrated that explanatory and referential contributions provided good grounds for collaborative practices of negotiation and trust-building to develop in a wiki, whilst direct advice without clear references to others led to fewer negotiation processes and a vertical division of labour approach to collaboration. In this regard, findings revealed that some teachers engaged in few participatory practices in the wiki. This was particularly evident in the behaviour team. Also, some attitudes to technology use affected negotiation processes within the teams. In addition, some practices the wiki platform (e.g. extensive writing, time gaps) limited these negotiation processes more visibly. Nonetheless, teachers' uses of Google Docs' editing tools supported collaborative practices by making their references clearer and more visible to others. This hints at the possibilities and challenges of using the Google Docs wiki for mediating collaborative activity; in this regard, I have argued that fostering an understanding of collaboration for the sake of balancing participants' approaches to contributing (e.g. less advice and more explanations) can support collaboration processes, and for example lead to community formation in a wiki. First and foremost, findings showed that teachers' ways of interacting in the wiki did not support collaboration in the constructive sense of the word, because the problem-solving strategies emerged after teachers had been advised on what to do, not during joint construction. However, collaboration manifested itself as a form of emotional and cognitive support through direct advice and encouragement to others, suggesting that collaboration took on collegial dimensions in this group of teachers encouraged by sharing, telling, and asking for aid. In this study, I have suggested that this collegial approach emerged naturally from the practice of professional development itself.

Interestingly, findings demonstrated the importance of an active contributor who leads interaction for collaborative activity to occur in a wiki. For me, this shows the affective dimension that

collaboration adopts, as following the lead of a peer seemed to energize collaborative activity in a wiki. Finally, social interactions were few and concise, which led me to reflect on the challenges imposed on course designers and facilitators to satisfy individual needs and on how the practice of collaboration is more important than expressing intentions to collaborate. This is a fact I attributed to a *collaborative momentum*.

3. **How do teachers approach support, guidance, and facilitation in the professional development experience?**

This study evidenced that teachers approached support, guidance, and facilitation during the professional development processes in accordance with their academic and professional needs and interests. Here, our collaborative relationships were dictated by teachers' dispositions and actions regarding collaborative work, thus both collaborative processes and collegial aspects of support, trust, and respect emerged through a mutual interrelation between us. Regarding facilitation in the wiki, findings demonstrated the importance of adopting an active role for promoting interactions in a wiki. Primarily, I learnt that facilitation in a wiki involves adopting various managerial skills, the most important of which is to help teachers to diversify their attitudes and roles and make the most from the natural roles adopted. All in all, this suggests that the level of collaborative involvement is directly relevant to the importance that I, as facilitator, attach to the collaborative activity. Finally, through this study, I explored aspects of my professional practices including the uses of email technology for sharing, support, guidance, and collaboration with the teachers, and the application of strategic questions for embracing teachers' explanations for co-construction rather than replies for specific concerns.

8.3 Contribution to knowledge

This study explored the mediating role of technology in the professional development of school Chilean teachers with a focus on collaborative activity in a wiki through a technology-enhanced approach to action research. Based on this and considering the findings presented in section 8.2 (p.231), I identified key aspects that contribute to the understanding of professional development in online environments in a Chilean context. Primarily, MINEDUC has considered technology use

as one of the main pillars for teachers' professionalization in its national policies in the last years (MINEDUC, 2018a). This study sheds light on the many factors that can influence either positively or negatively the implementation of online professional development offerings (e.g. school support, teachers' attitudes to collaboration). Also, this study shows that providing basic guidelines on technology use and appropriate adjustments to use it can support major transformations in the Chilean context. This study also contributes to research on collaboration in discussion-based platforms with a focus on the practices of building trust, negotiation, and division of labour, either in Chile or abroad. In Chile, research on teachers' collaborative practices has adopted broad perspectives in topics such as sharing, support, and transmission of information. The adaptation of theoretical perspectives as a framework to understand collaboration stands as a contribution in a Chilean context that promotes the inclusion of traditional approaches to collaboration (Mercer, 1995; Roschelle & Teasley, 1995; Dillenbourg, 1999; Crook, 2000) in the analysis and interpretation of the actual collaborative activity of teachers in online environments. This also illuminates the importance of being creative, exploratory, and practical in research. As mentioned in section 2.4.4 (p.61), Chilean researchers and university centres are interested in collaborative-based technologies by exploring new uses and approaches for students' instruction and teacher education. This study contributes to the wiki-based research tradition by mainly advocating for the practicality of technologies embedded in daily practice as tools for development through connectivity, along with identifying the necessary conditions for collaborative practices of negotiation, trust-building, and division of labour to occur when working remotely. These conditions hint at the criticality of an explanatory style when making contributions as the primary approach for the emergence of negotiations leading to co-construction in discussion-based platforms. Importantly, I believe that this study highlights the impact of MINEDUC policies over many years on the collaborative practices of Chilean teachers, thereby demonstrating that collegiality is important for Chilean teachers and that any adjustments aimed at securing collegiality in schools are essential.

In the arena of action research, this study contributes to the understanding of the various uses of technology for action research in a Chilean context. Technology has been incorporated to enable research processes in a Chilean context (Smith et al., 2014; Burns & Westmacott, 2018). This study introduces a technology-enhanced problem-solving alternative which can serve as an induction to

research in some contexts, thus bringing research closer to teachers in several realities and complementing action research knowledge in Chile, with the prominence of school contextual support emerging as the main contribution of this study. This study also adds a new perspective to the analysis of collaboration through interaction analysis (Jordan & Henderson, 1995). This is not a new approach to research students' learning in European contexts (Rasmussen, 2005; Fulberg 2010, 2016). The application of interaction analysis in wikis is novel in Chile; thus, this study adds new perspectives to explore and understand social interaction at a distance.

8.4 Implications for practice

So far, I have highlighted the main findings showing how the challenges and possibilities technologies offer for mediating the processes of online professional development and collaboration in The Wiki Project. I have also referred to my practical learning and the importance of diversifying and making the most of technology use to transform the attitudes and roles that teachers adopt in collaborative activities in wikis and emails, hence transforming simple interactions into meaningful experiences for learning (i.e. collaborations). Through the analysis of these issues, I can now discuss the implications for practice I envisage.

8.4.1 Contextual support

Findings evidenced that the local school context granted possibilities (e.g. resources, colleagues' support, permission) and challenges (e.g. time limitations, extra-curricular activities) in the technological mediated process, suggesting the importance of the context in teachers' professional development experience. With this idea in mind, I argue that if some form of online professional development similar to The Wiki Project (i.e. involving a considerable amount of technology-mediated work from teachers) is implemented, then specific contextual considerations must be addressed.

First and foremost, in Chile most schools are equipped with technological facilities, Internet access and libraries with educational resources, including journals, didactic material, and newspapers (MINEDUC, 2018a). First and foremost, MINEDUC has put at teachers' disposal ICT directives

(MINEDUC, 2011) suggesting how technologies can be used for professional development. In this study, these ICT directives and resources were used by the teachers for their arguments in discussions. Therefore, it is pertinent to induce teachers into professional development programmes with these broader considerations in mind, thus "tacitly" complementing the pursuit of MINEDUC's goals of professionalization involving for example the two core areas of *research* for taking the lead on one's own development and *collaboration* for making resourceful use of the cognitive potential embedded in dialogue with peers (MINEDUC, 2018b). For me, the acknowledgement of these aspects in any professional development experience involving teachers in public and private sectors can include a coherent developmental pathway in accordance with the strategic trajectory of professionalization envisaged for Chilean teachers over the last years, three decades after the Military government.

The analysis of the teachers' trajectories revealed that three of them drew from their colleagues' contributions for supporting aspects of their implementations, suggesting the importance of collegial aspects in their professional development. Thus, it is crucial to address *explicitly* the potential of working with others in technology mediated-research processes such as The Wiki Project. Here, I refer to the work conducted with other colleagues at the school level as a source of companionship to avoid the sense of isolation that technology generates, embrace new perspectives of teaching and learning, support research processes and, more importantly, create a broader impact by influencing others at the school level to establish professional development aims through indirect or direct involvement.

Finally, the pervasive contextual situations affecting the teaching profession such as insufficient time, extra-curricular activities, or tight schedules hindered aspects of one teachers' project. Although I argued that these situations were expected as part of the natural professional development process in schools, this showed the need to adapt schedules to facilitate teachers' professional research work. For me, this supports MINEDUC's idea to reduce teachers' working load to 60 percent of teaching hours, with 40 percent being reserved for lesson preparation and administrative tasks by 2023 (MINEDUC, 2016). This is important for Chilean teachers, since it will improve their productivity and their status as professionals, while also granting better opportunities for them to learn, think, plan classes with time, and, more importantly, engage in

collaborative relationships involving dialogue in their own schools and with other schools through technology.

8.4.2 Bolstering teachers' understanding of collaboration and technology use

Teachers valued collaboration for their professional development. This view manifested itself in the various accounts presented in profiles; nonetheless, engaging in collaboration did not emerge as a standard practice in teachers, a phenomenon I attributed to a *collaborative momentum*. Importantly, teachers provided direct advice as a primary collaborative approach in a wiki preventing the emergence of practices of negotiation that could lead to collaboration. All in all, this suggested the need to reinforce understanding about the meaning of collaboration before engaging in collaborative activities for teachers' professional development. This finding can be extrapolated to MINEDUC's newly implemented teacher career development Law N° 20.903 for 2023 (MINEDUC, 2016), and invites critical evaluation of the emphasis that MINEDUC is giving to teachers' professionalization. I argue that MINEDUC (primarily) should promote the understanding of what professional development really means (involving collaboration and reflection), and its value for education and the person in society, rather than reducing teachers' development to standardized goals, as this generates apathy, competitiveness, and a sense of ongoing evaluation in teachers. If this vision prevails in Chile, professional development will be reduced and one of the core areas of development that MINEDUC had envisaged (such as collaboration) will be transformed into an emphasis on individual productivity and self-achievement. This problem has its roots in market-oriented models and policies promoted by the Military government, being reinforced by today's biased perceptions that equate development with the achievement of standards in tiers (e.g. SIMCE for measuring the quality of education in Chilean schools). These views are still prevalent in some pre-service programmes, as reported by Barahona (2014). From this perspective, it seems important for teachers in Chile to orchestrate and reinforce collaborative and reflective arrangements, for example, through colloquia, open seminars, networks, and school round-table meetings to evaluate the possibilities/challenges of the new standardized approaches to professionalization through negotiations and not impositions, as teachers have argued (and are still arguing) over recent years.

The use of technology in The Wiki Project proved not to satisfy all teachers' professional needs, evidencing the necessity of contextual support, adaptations, and face-to-face guidance, along with a change in professional attitudes to technology use. Based on this evidence, I have argued for the need to approach technology use pertinently in professional development programmes, thus complementing and supporting developmental processes in a non-compulsory approach for the development of teachers. Like the Champion Teachers Programme (Smith et al., 2014), some problems with technology emerged in this study, limiting developmental pathways in teachers' action research processes. For me, this demonstrates a clear necessity to educate teachers about the use of technology for professional development. This aspect is primordial in Chile due to teachers' idiosyncrasies, which in my experience prevent them from answering emails when losing interest or when facing complications in the continuation of professional development programmes, or due to some ingrained beliefs suggesting uses of technology for instrumental processes only. Perhaps educating teachers on the broader benefits that technology can bring for collaboration and reflection, so that technology can be understood as serving, rather than replacing developmental processes, or subtly showing them (both in in-service and pre-service programmes) that the relationships that we establish through technology can also suggest professional attitudes, can make a difference over time.

8.4.3 Pertinent action research, reflective frameworks, and online facilitation

The technology-enhanced action research approach and the professional development activities in The Wiki Project acted as a good framework for supporting processes of reflection and collaboration at a distance, suggesting a need to encourage teachers' realistic and contextually appropriate action research frameworks when promoting teacher-led research in Chile. Like the Champion Teachers Programme, this study has shown that adopting face-to-face components for orientation would be a good start for establishing trust in teachers. The structuring of clear research stages, the adaptation of those stages to teachers' contextual needs, the jargon-free and experience-based approach including reflective and collaborative activities, along with continuous companionship-based support through technology, emerged as important options for teachers like Camila and Danitza. However, when teachers are more dependent on direct support or their needs overcome the scope that technology can mediate, the technology-enhanced action research

approach may not be appropriate. Thus, policy makers and course designers should be thoughtful and strategic on the use of technology in action research initiatives; also, possible additional collaborative offline activities and the organization of working teams could be based on teachers' location or more personal approaches to technology use such as telephone or Skype conversations (Smith et al., 2014). These initiatives can fill the physical gaps that a lack of face-to-face contact promotes, sustaining a significant option for teachers' learning.

In this regard, the social practices observed in teachers' technology use (e.g. camera off in interviews, extensive writing in wikis), some contextual aspects (e.g. tight schedules, interruptions, school holidays), and attitudinal dispositions (e.g. short replies, no replies to emails, or giving advice in wikis) affected the involvement of teachers in reflective and collaborative domains through the professional development activities presented. This reveals challenges for engaging teachers in more personal, reflective, and emotional forms of communication at a distance. Also, my findings outline the challenges and pertinent considerations that fellow researchers, teacher trainers, or course designers need to orchestrate to make the most of online encounters for reflective, collaborative, and narrative intents, as well as satisfying individual needs. Here, one aspect to consider is the need to internalize reflective practice into the daily work of teachers and then expand their reflective learning potential through technology use, primarily, as I have argued in relation to collaboration and technology use, by inducting teachers into the essential aspects and professional value of reflection and reflexivity. MINEDUC has triggered movements in that direction through the implementation of programmes for teachers' professional development (see table 1.1, p.23), including reflective activities through poster presentations, grids, and experiential account in seminars, workshops, and long-term programmes; however, I have pointed out that these offerings are not balanced for all Chilean teachers' subjects, indicating a need to adjust them for equity.

I played an important role in teachers' professional development process, including their collaborative activity in the wiki. In fact, in this study, I have presented reasons suggesting that I became important due to being the creator, designer, and facilitator of The Wiki Project and because of my insider role where I exercised influence to improve practice (McNiff & Whitehead, 2006). Adopting this central role brought understanding of my professional practices (e.g. uses of

emails, strategies for asking questions) with the support of reflective frameworks (e.g. Gibb's reflective cycle) and techniques (e.g. literature entries) broadly suggesting an extension of the research process itself through the awareness of situations, changes in my learning, and positioning as action researcher (see section 4.1.5, p.97). As such, I consider it important for action researchers (both novice and experienced) who decide to explore the learning processes of teachers, students, and teacher trainers to work with reflective frameworks that sustain understanding over time and provide valuable means to connect with individual learning in the best way. Here, the options are diverse, including learning logs, audio or video recordings, narrative strategies, and portfolios, all of which help legitimize the view that adaptation of any suitable strategy or framework for learning is beneficial, whilst ensuring that a mechanistic approach to reflection is avoided (Mann & Walsh, 2017).

In this study, findings demonstrated a need to adopt an active role for promoting interactions in Google Docs as a wiki for diversity and making the most of teachers' roles for collaboration to happen. This is important because Google Docs proved not to support collaborative construction of strategies by teachers, basically suggesting that collaboration involved a mutuality of intentions and actions and that the treatment of the activity was central. For me, this suggests that a facilitator primarily needs to understand the features of the space of negotiation, including its possibilities and limitations; then, he/she can interpret teachers' needs, interests, working styles, attitudes, and participatory practices by observing, interacting, and reflecting, to finally act and move any collaborative momentum into practical actions, sustain the ideal collaborative state, and promote the balance between advice and explanations through, for example, exemplification and guidance. Finally, through the exploration of my practices, I identified the possibilities of email technology for co-construction over time, while also noticing the importance of strategic questions for embracing collaborative opportunities in a wiki rather than the eliciting of information. These insights are relevant to me and to programmes including online facilitation in a Chilean context (Champion Teachers, Moodle, and MOOC blended programmes), where a closer emotional connection, active communication, and online collaboration are required to articulate comprehensive developmental opportunities.

8.5 Strengths of the study

One of the strengths of this study relates its exploration of the process of professional development through a *trajectory*. Consider, for example, the historical accounts (see section 1.4, p.16) that exemplified the trajectory of historical events in Chile and how specific events promoted changes in teachers' professional roles: they went from being active contributors to society with the aid of a benefactor state to having their professional practices neutralized through the repression of thinking and the introduction of neoliberal ideologies to education during the military government (Ávalos, 2003; Nuñez, 2002). I argue that this example can be used to show teachers' professional development trajectory presented in this study, where significant events such as interacting with others, implementing actions, or facing difficulties in their developmental pathways led them to adopt new professional roles, change their ways of thinking, or modify their attitudes (i.e. to perspectives of teachers' development as the times and events dictated). As such, the analysis of trajectory stands as a strength for understanding professional development in a context evolving due to a new educational reform in Chile.

This study has highlighted the importance of *collegiality* in teacher's professional development. This is an aspect sometimes regarded as obvious but for me, it has proved to have an enormous potential for sustaining the professional development pathways of teachers with a focus on the importance of context as support and people as mediators of learning processes in activities. Finally, this study highlights some of the factors that made *technology use* pertinent in a Chilean and international context. Basically, the use and alternation of practical, free, and accessible technologies (e.g. emails, Google Doc, and Skype) emerged as a significant option for a group of teachers to communicate at a distance for their development. For me, this suggests that professional development resides in teachers' personal drive to improve professional practices through the technological support available, along with the creativity of teacher trainers, researchers, course designers, or policy makers to use technology as a learning space through interaction for collaboration and reflection, as other studies have proved (Lai & Ng's, 2011; Rodesiler, 2017).

8.6 Limitations of the study

Three conflicting areas surfaced during the implementation of this study. The first related to the teachers' administrative duties and personal *busy lives* limiting their participation in the project. For example, some of the participants had heavy workloads involving extra duties apart from the current teaching, while others were pursuing degrees and therefore had little time to actively engage in the study. These situations created barriers to interact, reflect in narrative activities, and engage in collaboration. Although I prevented some of these issues by contacting the less active participants directly to make them feel that they were not alone and to motivate them in their research endeavours, promoting the practice of collaboration was key aspect of this study, further emphasised by some natural factors which I have argued can be prevented but not foreseen.

A second and important limitation refers to the nature of teachers' research processes. Here, distance, the technological components used to bridge that distance, and my intentions of exploring collaboration led to a focus on the practicality of *problem-solving*, which at times, restricted further activities. For example, this caused restrictions for acknowledging research as an emancipatory and transformative practice through the linking of theory-practice for understanding broader issues, or a more in-depth exploration of the problem for awareness raising. I would argue though, that the essential aspects of the cycles of action research were addressed in the best way, serving as vital in action research for this group of teachers, although further refinements and contextual accommodations are needed. Finally, this study included eleven participants. Of these, nine teachers followed a trajectory of professional development by collaborating in a wiki, planning activities, implementing actions and reflecting about their projects, among other actions. Nonetheless, as online research work progressed, some of their professional practices became more visible than others and, because of analytical decisions regarding the presentation of three trajectories, it was not possible to explore deeply and represent the experiences of all teachers as I would have wanted. In general, studies that focus on a sample of participants within a wider sample (Musanti & Pence, 2010; Forte & Flores, 2014) acknowledge these access and practical limitations. This situation highlights the importance of conducting wider professional development initiatives, maybe for generalization within the Chilean context. Nevertheless, I would like to address the

importance of these research findings as a guide for future research and promote further professional debate on collaboration in online environments.

8.7 Recommendations

Three recommendations are important to address. First, this study showed that adopting a contextually pertinent action research framework that alternates online and face-to-face components can provide continuous companionship and encourage autonomy and decision-making in teachers, among other features. Collaborative, reflective, and inquiry concerns for solving problems were supported by this framework. Thus, it would be advisable for MINEDUC to promote and support more research programmes (like Champion Teachers, 2018) beyond the ELT field, moreover, that the options of scholarships abroad, teachers' networks, methodology courses, and online offerings continues and diversifies to encompass a broader range of possibilities for collaboration, reflection, and inquiry in all subject areas. This would also imply reconsidering the implementation of Law N° 20.903 of teachers' career development to avoid the growing tensions leading to strikes in Chilean schools. Perhaps, workshops highlighting the benefits of standardization, documents sharing successful stories in portfolio tasks, exclusive school networks for support, concrete improvement in working conditions, and basically a willingness to negotiate for consensuses with teachers would emerge as an alternative for mutual development opportunities.

Second, this study demonstrated that teachers themselves played the main role in their development; hence, they should be encouraged to explore the various ways in which they can develop professionally in Chile. Offerings are varied and involve the macro-context of MINEDUC's educational policies and programmes, the meso-context in their school communities (e.g. the work of subject clusters, networks), but more importantly, it is advisable for teachers to look at their colleagues *in action* for motivation and learn from their experiences, including struggles and successes.

Finally, the main aim of this study was to explore how technology mediated the professional development process of Chilean teachers and their collaborative activity in a wiki. In this last

regard, collaboration adopted affective dimensions, which included aspects of leaderships energizing collaboration in one team, narratives and their links with values and emotions, teachers' positive attitudes to collaboration, and collegiality as a source of support, sharing, and aid. In this context, it would be interesting to expand our understanding of the affective dimension of collaboration in a Chilean context and its manifestations through technology through an ecological research approach, including cognitive, social, and emotional dimensions evenly (Crook, 2011). This study adopted a socio-cultural approach, although in-depth attention and focus on trust-building, the implications of social presence in online collaboration, the potential of narrative activities for collegiality and collaboration, and the personal barriers hindering collaboration are important to examine.

8.8 Concluding reflections

The crafting of this study involved a whole *creative process* embracing my vision of professional development, both of my participants and myself, as constructed over a period of time. Since becoming a professional teacher back in 2001, I started to build my professional development path, therefore, I appropriated skills and professional attitudes and embraced new ways to see my actions through reflection and collaboration. For me, this seems common sense now because I have learnt that it was the constructive aspects of learning with others in professional development activities, the impact of dialogue in teachers' meeting/seminars/hallways, my participation in the programmes implemented by MINEDUC (e.g. Champion Teachers, ELT courses, Pasantias, etc.) during the democratic period (and its continuity), the relevance of mediating tools for learning (including technology), along with my personal interests that formed the layers of my professional framework converging into learning. First and foremost, and linking my practical experience to this study, I can claim that it was my involvement in a series of professional/academic events throughout these PhD years, including narrative modules, conferences, and the various conversations about collaboration with my supervisors that provided the meaningful situations which converged in this final study. As such, I see the importance of highlighting these episodic moments in this PhD journey, or as I learnt in my master's studies at MARJON, the most significant links to my learning.

First, the constructive side of the *crafting of the trajectory,* let alone its analysis, stood as one of the main challenges for me in this study. The crafting processes reopened aspects of teachers' developmental processes recursively, which demonstrated that facets of the analysis emerged when writing up through action and interpretation (Clarke & Braun, 2013). In fact, it was through the different attempts to represent these processes that my reflective practice started to converge into understanding of collaboration, and the essential aspects involved in that process. All in all, I am suggesting that my learning merged constructive views of knowledge through reflective intents. In addition, this crafting process brought together views merging the arena of interpretation as a collaborative process, where Danitza, Camila, and Fernanda's experiences complemented my personal views and assumptions regarding the uses of technology, reflection, collaboration, and research. However, I also experienced concerns regarding the process of interpretation of experiences, because I felt tensions, for example, between my personal views of technologies as tools for learning and the teachers' actions and comments on in this matter. Nonetheless, these tensions gave me chances to infuse my reflective logs with more significance as I included my own experiences, memories, and stories, thus re-experiencing them.

The narrative module I undertook in 2014 at Bristol University opened a door for me to express my personal narrative with confidence, along with embracing an understanding of the potential of narrative for reflective practice. In fact, I see narrative as an enormous possibility for teachers' professional development because it addresses emancipation through the expression of inner voices regarding teaching, a clear connection with teachers' values and beliefs, an impetus in experiences for learning, and the encouragement of development as a person (i.e. an experiential, reflective, illuminative, and accessible approach to learn from the self) (Clandinin et al., 2000; Bold, 2012). The emergence of professional values in teachers' accounts exemplifies this inner and practical connection. Therefore, I have made up my mind that narrative is, and will be a companion in my future professional practices as either teacher, teacher trainer, or researcher. Finally, it will be evident to anyone reading this dissertation that McNiff and Whitehead's (2006; 2013) work in action research, and their ideas about influence, values, and action research as an organic process have enriched my thinking. In fact, their ideas helped me to reconsider my initial intentions to represent research processes (see figure 4.2, p.94) in less linear and rigidly structured stages, since the process was complex, featuring recursive overlaps and emerging reconfigurations –just like

learning itself. I see now that any representations of learning, such as teachers' learning in this study (see figure 3.1, p.86) or models of technology-based learning (see figure 2.2, p.53 & 2.3, p.54) should consider collaboration and reflection as core components. For me, it is the ongoing configuration of these processes in practice that transforms learning into development by giving *meaning* to people's actions, making mediational tools significant for learning, and encouraging attitudes for learning through social interaction.

Findings in this study highlighted that education about technology use and collaboration is critical for promoting meaningful professional development experiences online. These findings interestingly indicate that the research gap identified (i.e. few studies addressing collaborative practice in discussion-based technologies including wikis, blogs, forums, and discussion boards) needs to be further explored for promoting teachers' new professional uses of technologies in a Chilean context. For example, new explorations might reinforce the key collaborative one-to-one dimension email communication opens for constructive regards when collective communication is not leading to negotiations, or the importance of explanations in discussion-based platforms, like a wiki, to promote further references leading to negotiation. In addition, it is interesting to highlight that for bolstering teachers´ understanding of (online) collaboration aspects like school support, uses of technologies for construction, attitudinal dispositions to working with others and teachers´ practical professional actions are all socio-cultural components for teachers´ development. For me, it is the ongoing configuration of these components in practice that transforms learning into development by giving *meaning* to people´s actions, making mediational tools significant for learning, and encouraging attitudes for learning through social interaction.

References

Allwright D. and J. Hanks (2009). The Developing Language Learner: An Introduction to Exploratory Practice. Basingstoke: Palgrave Macmillan, 312 pages, ISBN 978-1403985323

Allwright, D. (2015). Putting 'understanding' first in practitioner research. In K. Dikilitaş, R. Smith, & W. Trotman (Eds.), *Teacher-researchers in action* (pp. 19–36). Faversham: IATEFL.

Altrichter, H., and P. Posch. (2009). Action research, professional development and systemic reform. In S. Noffke, and B. Somekh (Eds.), *Handbook of educational action research* (pp. 213–25). Thousand Oaks, CA: Sage.

Altrichter, H., Posch, P., & Somekh, B. (1993). *Teachers investigate their own work: An introduction to the methods of action research*. New York: Routledge.

Antaki, C., (1994). *Explaining and Arguing: The social organisation of accounts*, London: Sage.

Avalos, B. (2011). Teacher professional development in Teaching and Teacher Education over ten years. *Teaching and Teacher Education, 27*(1), 10-20.

Ávalos, B. (2010). Educational change in Chile: Reform or improvements? (1990-2007). In A. Hargreaves, A. Lieberman, M. Fullan, & D. Hopkins (Eds.), *Second international handbook of educational change* (pp. 383-396). New York, NY: Springer.

Ávalos, B. (2003). La formación de profesores y su desarrollo profesional. Prácticas Innovadoras en busca de políticas. El caso de Chile. In C. Cox (Ed.), *Políticas educacionales en el cambio de siglo: la reforma del sistema escolar de Chile* (pp. 559-594). Santiago de Chile: Editorial Universitaria.

Ávalos, B. (2002). *Profesores para Chile: historia de un proyecto*. Santiago de Chile: Gobierno de Chile, Ministerio de Educación.

Azmitia, M. (2000). Taking Time out from Collaboration: opportunities for synthesis and emotion regulation. In R. Joiner, K. Littleton, D. Faulkner & D. Miel (Eds.), *Rethinking Collaborative Learning* (pp. 179-195*)*. London: Free Association Books.

Barahona, M. (2014). Exploring the curriculum of second language teacher education (SLTE) in Chile: a case study. *Pontificia Universidad Católica de Valparaíso Perspectiva Educacional*. Formación de Profesores. Junio 2014, Vol. 53(2), Pp. 45-67.

Barfield, A. (2016). Collaboration. *ELT Journal, 70*(2), 222-224.

British Educational Research Association (BERA) (2018) *Ethical guidelines for educational research*. 4th ed. Available at: https://www.bera.ac.uk/researchers-resources/publications/ethical-guidelines-for-educational-research-2018 (Accessed: 30 April 2019).

Bereiter, C. & Scardamalia, M. (2014). Knowledge building and knowledge creation: One concept, two hills to climb. In S. C. Tan, H. J. So, J. Yeo (Eds.), *Knowledge creation in education* (pp. 35-52). Singapore: Springer.

Biasutti, M. (2017). A comparative analysis of forums and wikis as tools for online collaborative learning. *Computers & Education*, 111, 158-171.

Biasutti, M., & El-Deghaidy, H. (2015). Interdisciplinary project-based learning: an online wiki experience in teacher education. *Technology, Pedagogy and Education*, 24(3), 339-355.

Bold, C (2012). *Using Narrative in Research*. London: Sage.

Bolton, G. (2010). *Reflective Practice Writing and Professional Development*. London: Sage.

Borg, S. (2014). *Teacher research: Practical and relevant classroom inquiry*. Retrieved November 20, 2014, from http://www.cambridge.org/elt/ blog/2014/02/teacher-research-practical-relevant-classroom-inquiry.

Boud, D., Keogh, R. & Walker, D. (1994). *Reflection: Turning Experience into Learning*. London: Kogan Page.

Brass, J., & Mecoli, S. (2011). The (failed) case of the Winston Society wikispace: The challenges and opportunities of web 2.0 and teacher education. *Contemporary Issues in Technology and Teacher Education, 11*(2). Available from: https://www.citejournal.org/volume-11/issue-2-11/english-language-arts/the-failed-case-of-the-winston-society-wikispace-the-challenges-and-opportunities-of-web-2-0-and-teacher-education

Braun, V. and Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3 (2). pp. 77-101. Available from: http://eprints.uwe.ac.uk/11735

Brna, P. (1998). Collaborative virtual learning environments for concept learning. *International Journal of Continuing Engineering Education and Life-Long Learning*, 8(2).

Brox, H. (2017). What's in a wiki? *Nordic Journal of Digital Literacy, 12*(04), 129-142.

Brunner, J. (1997). From state to market coordination: the Chilean case. *Higher Education Policy, 10*(3).

Bullock, D, & Smith, R.C. (Eds.). (2015). *Teachers research!* Faversham, Kent: IATEFL.

Burns, A. (2015). Renewing classroom practices through collaborative action research. In Dikilitaş, K., Smith, R., & Trotman, W. (Eds.), *Teacher Researchers in Action* (pp. 9-18), IATEFL, No 2 – 3.

Burns, A., & Westmacott, A. (2018). Teacher to researcher: Reflections on a new action research program for university EFL teachers. *Profile: Issues in Teachers' Professional Development*, 20(1), 15-23.

Burns, A., Westmacott, A., & Hidalgo Ferrer, A. (2016). Initiating an action research programme for university EFL teachers: Early experiences and responses. *Iranian Journal of Language Teaching Research*, 4 (3), 55-73.

Burr, V. (1995). *An introduction to social constructionism*. London: Routledge.

Bustamante, C. & Moeller, A. J. (2013). The convergence of content, pedagogy, and technology in online professional development for teachers of German: an intrinsic case study. (Report). In *CALICO Journal*. 30 (1), 82(23).

Butler-Kisber, L. (2010). *Qualitative inquiry: thematic, narrative and arts-informed perspectives*. Los Angeles; London: Sage.

De Beaugrande, R.A. & W.U. Dressler (1981). *Introduction to Text Linguistics*. London: Longman.

Cakir, H. (2013). Use of blogs in pre-service teacher education to improve student engagement. *Computers & Education, 68*, 244-252.

Campos, N. (2000). *Historia de la educación obligatoria en Chile 1810-1997.* Santiago: Fundación Claude Bernard.

Carnoy, M. (2003). Las políticas educacionales de Chile desde una perspectiva internacional. In C. Cox (Ed.), *Políticas educacionales en el cambio de siglo. La reforma del sistema escolar de Chile* (pp. 115–124). Santiago: Editorial Universitaria.

Carr, N. (2008). Wikis, knowledge building communities and authentic pedagogies in pre-service teacher education. In *Hello! Where are you in the landscape of educational technology?* Proceedings Ascilite Melbourne 2008. Available from: http://www.ascilite.org.au/conferences/melbourne08/procs/carrn.pdf

Chan, C. K. K., van Aalst, J., & Law, N. (2008). Developing principle-based understanding for knowledge-building in a teacher community. Paper presented at the Annual Meeting of American Educational Research Association, New York.

Chan, C. K. K. (2011). Bridging research and practice: Implementing and sustaining knowledge building in Hong Kong classrooms. *International Journal of Computer-Supported Collaborative Learning, 6*(2), 147-186.

Chase, S. E. (2005). Narrative Inquiry: Multiple Lenses, Approaches, Voices. In N. K. Denzin & Y. S. Lincoln (Eds.), *The Sage handbook of qualitative research* (pp. 651-679). Thousand Oaks, CA,: Sage Publications Ltd.

Chowcat, I. (2005). Models of e-learning: the importance of context. Preceding ALT-C 2005 12th International Conference, Manchester University, UK.

CiSELT (2013). British Council the Certificate in Secondary English Language Teaching. Retrieved from: https://www.britishcouncil.cl/en/teach/courses/ciselt.

Clandinin, D. J., & Connelly, F. M. (2000). *Narrative inquiry: Experience and story in qualitative research*. San Francisco: Jossey-Bass.

Clarà, M. (2016). Vygotsky and Vasilyuk on Perezhivanie: Two Notions and One Word. *Mind, Culture, and Activity, 23*(4), 284-293.

Clarke, V. and Braun, V. (2013). *Successful qualitative research: A practical guide for beginners.* London: Sage.

Claxton, G. (1999). *Wise Up*. London: Bloomsbury.

Cole, M. (1998). *Cultural Psychology: A Once and Future Discipline*. Cambridge, MA: Harvard University Press.

Coles, A. T. (2016). Facilitating the discussion of video with teachers of mathematics: the paradox of judgment. Proceedings of the 40th Conference of the International Group for the Psychology of Mathematics Education. Lulu.

Collins, M.P. and Berge, Z.L. (1996). Facilitating Interaction in Computer Mediated Online Courses. *Proceedings of the FSU/AECT Conference on Distance Learning*. June 20-23, Tallahassee, FL.

Conrad, C., & Serlin, R. C. (2011). *The SAGE handbook for research in education: pursuing ideas as the keystone of exemplary inquiry* (2nd ed.). Los Angeles; London: SAGE.

Cooney, A. (1999). Reflection demystified: answering some common questions. *British Journal of Nursing* 8(22) 1530-1534.

Cox, C. (2005). Las políticas educacionales de Chile en las últimas dos décadas del siglo XX. In C. Cox (Ed.), *Políticas educacionales en el cambio de siglo. La reforma del sistema escolar de Chile* (pp. 19-113). Santiago: Editorial Universitaria.

Craft, A. (2000). *Continuing Professional Development*. London: Routledge Falmer.

Creswell, J. (2009). *Research Design. Qualitative, Quantitative and Mixed Methods Approach.* Los Angeles: SAGE Publications, Inc.

Creswell, J. W. & Miller, D. L. (2000). *Determining validity in qualitative inquiry*. Theory into Practice, 39(3), 124-131.

Creswell, J. W. (2009). *Research design: qualitative, quantitative, and mixed methods approaches* (3rd ed.). Los Angeles; London: Sage.

Crook, C. (1999). Computers in the Community of Classrooms. In K. Littleton & P. Light (Eds) *Learning with Computers: analysing productive interaction* (pp. 102–117). London: Routledge.

Crook, C. (2000). Motivation and the Ecology of Collaborative Learning. In R. Joiner, K. Littleton, D. Faulkner & D. Miell (Eds.), *Rethinking Collaborative Learning* (pp. 161–78). Free Association Books: London.

Crook, C.K., (2011). Versions of computer-supported collaboration in higher education. In Ludvigson, S.., Lund, A., Rasmussen, I., Saljo, R., (Eds.), *Learning across sites: New tools, infrastructures and practices* (pp. 156-171). Abingdon: Routledge.

Crotty, M. (1998). *The foundations of social research. meaning and perspective in the research process*. Thousand Oaks, Calif: Sage Publications.

The Consultants-E (2016). Online EdTech training courses. Available at: www.theconsultants-e.com/trainingonline.

Daniels, H. (2001). *Vygotsky and Pedagogy*. NY: Routledge/Falmer.

Daniels, H., Cole, M., & Wertsch, J. V. (2007). *The Cambridge companion to Vygotsky.* Cambridge: Cambridge University Press.

Danielson, C. (2013). *The framework for teaching evaluation instrument*. The Danielson Group.

Danielson, C., (2006). *Teacher Leadership That Strengthens Professional Practice.* United States: ASCD Member Book.

Daniil, M. (2013). *Exploring the process of reflection within teacher education: a qualitative case study of student teachers using videopapers to reflect on practice*. Unpublished PhD thesis, University of Bristol.

David D. (2015). *Plataforma de Gestión del Conocimiento Basada en Arquitectura Colaborativa e Interfaz de Red Social*. Unpublished M.Ed. thesis, Universidad de Chile (UCH).

Day, C., Hadfield, M., & Kellow, M. (2002). Schools as learning communities: Building capacity through network learning. *Education 3-13, 30*(3), 19-22.

de Vries, S., van de Grift, W. J. C. M., & Jansen, E. P. W. A. (2014). How teachers' beliefs about learning and teaching relate to their continuing professional development. *Teachers and Teaching, 20*(3), 338-357.

Denzin, N.K., & Lincoln, Y.S. (2005). Introduction: The discipline and practice of qualitative research. In N.K. Denzin & Y.S. Lincoln (Eds.), *The sage handbook of qualitative research* (2nd ed.) (pp. 1-32) . Thousand Oaks, CA: Sage.

Dewey, J. (1933). *How We Think: A Restatement of Reflective Thinking to the Educative Process*. Boston: D. C. Heath. (Original work published in 1910).

Dillenbourg, P. & Baker, M.J. (1996). Negotiation Spaces in Human-Computer Collaboration. In Actes du colloque COOP'96, *Second International Conference on Design of Cooperative Systems* (pp. 187-206). INRIA, Juan-les-Pins, juin 1996.

Dillenbourg, P. (1999). *Collaborative learning: cognitive and computational approaches*. Amsterdam: Pergamon.

Donoso, S. (2005). Reforma y Politica Educacional en Chile 1990-2004: El Neoloberalismo en crisis. *Estudios pedagógicos* (Valdivia), 31, 113-135.

Dooly, M. A. (2008). Constructing knowledge together. In Dooly, M. (ed.), *Telecollaborative Language Learning: A guidebook to moderating intercultural collaboration online* (pp. 21-45). Bern: Peter Lang.

Dreier, O. (1999). Personal Trajectories of Participation across Contexts of Social Practice. *Outlines. Critical Practice Studies*, *1*(1), 5-32. Available from: https://tidsskrift.dk/outlines/article/view/3841.

Elliot, J. (1991). *Action Research for Educational Change*. Buckingham: Open University Press.

Elliot, J. (1985). Facilitating action research in schools: Some dilemmas. In R. Burgess (Ed.), Field methods in the study of education (pp. 235-262). London: Falmer Press.

Elliott, J. C. (2017). The Evolution from Traditional to Online Professional Development: A Review. *Journal of Digital Learning in Teacher Education*, 33(3), 114-125.

Engeström, Y. (1987). *Learning by expanding: An activity-theoretical approach*. Helsinki: OrientaKonsultit.

Engeström, Y. (1999). Activity theory and individual and social transformation. In Y. Engeström, R. Miettinen, & R.-L. Punamäki (Eds.), *Perspectives on activity theory* (pp. 19-38). New York: Cambridge University Press.

Eraut, M. (2011). Informal learning in the workplace: evidence on the real value of work-based learning (WBL). 25(5), 8-12.

Erstad, O. (2014). The expanded classroom—Spatial relations in classroom practices using ICT. *Nordic Journal of Digital Literacy*. 1(1): 8–22F.

Etherington, K. (2006). Reflexivity: Using our "selves" in narrative research. In Sheila Trahar (ed.), *Narrative research on learning – comparative and international perspectives* (pp. 77–92). Oxford: Symposium Books.

Evans, L. (2002). What is teacher development? *Oxford Review of Education* Vol. 28, No. 1, 123-137.

Evans, L. (2008). Professionalism, Professionality and the Development of Education Professionals. *British Journal of Educational Studies, 56*(1), 20-38.

Evans, L. (2014). Leadership for professional development and learning: enhancing our understanding of how teachers develop. *Cambridge Journal of Education, 44*(2), 179-198.

Fairclough, N. (1992). *Discourse and social change*. Oxford: Polity Press.

Feuerstein, R. (1980). *Instrumental enrichment: an intervention program for cognitive modifiability*. Baltimore, University Park Press.

Finlay, L. (2008). Reflecting on 'reflective practice'. *PBPL*. Paper 52. pp 1-27. Retrieved from: tinyurl.com/finlay-PBPL (Last accessed 5th April 2017).

Fjuk, A., & Ludvigsen, S. (2001). *The Complexity of Distributed Collaborative Learning: Unit of Analysis.* Paper presented at the ECSCL - European Perspectives on Computer-Supported Collaborative Learning, Maastricht.

Foley, B., & Chang, T. (2006, April). Wikis as a professional development tool. Paper presented at the American Education Research Association annual meeting, San Francisco, CA.

Fontana, A. (2003). Postmodern Trends in interviewing. In J. Gubrium & J. Holstein (eds.), *Post-Modern Interviewing* (pp. 51-66). Thousand Oaks, CA: Sage.

Fook, J., & Askeland, G. A. (2007). Challenges of Critical Reflection: 'Nothing Ventured, Nothing Gained'. *Social Work Education, 26*(5), 520-533.

Forte, A. M., & Flores, M. A. (2014). Teacher collaboration and professional development in the workplace: a study of Portuguese teachers. *European Journal of Teacher Education, 37*(1), 91-105.

Fuller, A. (2007). Critiquing theories of learning and communities of practice. In Hughes J., Jewson N. and Unwin L. (eds.), *Communities of Practice: critical perspectives* (pp.17-29*)*. Abingdon, Routledge.

Furberg, A. (2010). Scientific Inquiry in Web-based Learning Environments. Exploring technological, epistemic and institutional aspects of students' meaning making. (Doctoral thesis at InterMedia), University of Oslo, Oslo: Unipub.

Furberg, A. (2016). Teacher support in computer-supported lab work: bridging the gap between lab experiments and students' conceptual understanding. *International Journal of Computer-Supported Collaborative Learning, 11*(1), 89-113.

Gall, M. D., Gall, J. P., & Borg, W. R. (2007). *Educational research: An introduction*. Boston, MA: Pearson.

Garcia Huidobro J. and Cox, J. (1999). La reforma Educacional Chilena 1990-1998. In J. Garcia-Huidobro (Ed.), *La Reforma Educacional Chilena* (pp. 7-46). España: Editorial Popular, PROA.

Garrison, R. D., Anderson, T., and Archer, W. (2000). 'Critical Inquiry in a text-based environment: Computer conferencing in Higher Education'. *Internet and Higher Education*, 2(2-3), pp. 87-105.

Garrison, R.D. (2007). Online community of inquiry review: Social, Cognitive and Teaching Presence issues. *Journal of Asynchronous Learning Networks*, 11(1), pp. 61-72.

Gibbs, G. (1988). *Learning by doing: a guide to teaching and learning methods*. Oxford: Further Education Unit.

Goldstein, O., & Peled, Y. (2016). Pedagogical aspects of integrating wikis in pre-service teacher education. Technology, Pedagogy and Education, 25(4), 469-486.

Google (2018). Google Docs. Available from: https://www.google.com/intl/es_ALL/docs/about/.

Granberg, C. (2010). Social software for reflective dialogue: questions about reflection and dialogue in student teachers' blogs. *Technology, Pedagogy and Education,* 19(3), 345-360.

Guerrero Nieto, C. H. (2007). Applications of Vygotskyan concept of mediation in SLA. *Colombian Applied Linguistics Journal,* (9), 213–228.

Guskey, T. R. (2000). *Evaluating professional development*. Thousand Oaks, CA: Corwin Press.

Hadjerrouit, S. (2014). Wiki as a collaborative writing tool in teacher education: Evaluation and suggestions for effective use. *Computers in Human Behavior, 32*, 301-312.

Hall, L. A. (2018). Using Blogs to Support Reflection in Teacher Education. *Literacy Research and Instruction, 57*(1), 26-43.

Hargreaves, A. & Fullan, M.G (Eds) (1992). *Understanding Teacher Development*. London: Cassell.

Hargreaves, A. (1994). *Changing teachers, changing times. Teachers' work and culture in the Postmodern Age*. London: Cassell.

Hargreaves, A. (1996). Cultures of teaching: A focus for change. In Hargreaves, A. and Fullan, M. (Eds.), *Understanding teacher development* (pp. 216-240). New York: Teachers College Press.

Hatton, N. & Smith, D. (1995). *Reflection in Teacher Education: Towards Definition and Implementation*. The University of Sydney: School of Teaching and Curriculum Studies.

Helleve, I. (2010). Theoretical foundations of teachers' professional development. In J. O. Lindberg & A. D. Olofsson (Eds.), *Online learning communities and teacher professional development: Methods for improved education delivery* (pp. 1-19). Hershey, PA: Information Science Reference.

Hennessy, S., & Warwick, P. (2010). Research into teaching with whole-class interactive technologies. *Technology, Pedagogy and Education,* 19(2), 127-131.

Hennessy, S., Haßler, B., & Hofmann, R. (2016). Pedagogic change by Zambian primary school teachers participating in the OER4Schools professional development programme for one year. *Research Papers in Education, 31*(4), 399-427.

Hinostroza, E., Labbé, C. & Claro, M. (2005). ICT in Chilean Schools: Students' and Teachers' Access and Use of ICT. *Human Technology,* Volume 1 (2), pp. 246-264.

Hopkins, D. and Ahtaridou, E. (2008). *A teacher's guide to classroom research* (4th ed). Maidenhead: Open University Press.

Hoyle, E. & John, P, D. (1995). *Professional Knowledge and Professional Practice,* Cassell: London.

Ibieta, A., J. Hinostroza, J. & Claro, M. (2017) The role of the Internet in teachers' professional practice: activities and factors associated with teacher use of ICT inside and outside the classroom, Technology, Pedagogy and Education, 26:4, 425-438.

Investigacion UC (2018) Centro UC para la transformación educativa. Avaliable at http://investigacion.uc.cl/.

Ivic, I. (2000). *Lev S. Vygotsky*. UNESCO: International Bureau of Education.

James, P. (2001). *Teachers in Action: tasks for in-service language teacher education and development*. Cambridge: Cambridge University Press.

Jefferson, G. (2004). Glossary of transcript symbols with an introduction. In Lerner, G.H. (Ed). Conversation Analysis: Studies from the first generation *(pp. 13-31) Amsterdam/Philadelphia: John Benjamins.*

John-Steiner, V. & Mahn, H. (1996). Sociocultural approaches to learning and development: A Vygotskian framework. *Educational Psychologist*, 31 (3/4), 191-206.

Jones, N. & Peachey, P. (2005). The development of socialization in an on-line learning environment. *Journal of Interactive Online Learning*, 3(3), 1–20.

Jordan, B., & Henderson, A. (1995). Interaction analysis: Foundations and practice. *The Journal of the Learning Sciences,* 4, 1, 39-103.

Jovchelovitch, S. & Bauer, M. W. (2000). Narrative interviewing. In M. W. Bauer & G. Gaskell (eds.) *Qualitative Researching with Text, Image and Sound (*pp.57-74). London: Sage.

Kamarudin, N. (2015). "The Use of Facebook Group as an Informal Platform to Support Learners of English as a Second Language in a Higher Educational Context". Unpublished Pd.D. thesis. University of Bristol.

Katz, S., & Earl, L. (2010). Learning about networked learning communities. *School Effectiveness and School Improvement,* 21(1), 27-51.

Kelchtermans, G. (2006). Teacher collaboration and collegiality as workplace conditions. A review. *Zeitschrift für Pädagogik,* 52(2), 220-237 (Vol. 52).

Kemmis, S. and McTaggart R. (2000). Participatory Action Research. In Denzin, N.K. and Lincoln, Y.S. (Eds.) *Handbook of Qualitative Research*, Second Edition (pp.567-605). Thousand Oaks, California: Sage.

Kennedy, A. (2005). Models of Continuing Professional Development: a framework for analysis. *Journal of In-Service Education, 31*(2), 235-250.

Köksal, H. (1995). Reducing Teacher Resistance to Innovations, 6th IFIP World Congress, Aston University, Birmingham, UK.

Koshy, V. (2005). *Action research for improving practice*. London: Thousand Oaks, CA.

Kostiainen, E., Ukskoski, T., Ruohotie-Lyhty, M., Kauppinen, M., Kainulainen, J., & Mäkinen, T. (2018). Meaningful learning in teacher education. *Teaching and Teacher Education, 71*, 66-77.

Kozulin, A. (1998). *Psychological tools: A sociocultural approach to education*, Cambridge, MA: Harvard University Press.

Kozulin, A. (2002). Sociocultural theory and the mediated learning experience. *School Psychology International*, Sage Publications. 23(1), 7-35.

Kozulin, A. (2003). Psychological Tools and Mediated Learning. In A. Kozulin, B. Gindis, V. Ageyev, & S. Miller (Eds.), *Vygotsky's Educational Theory in Cultural Context*(Learning in Doing: Social, Cognitive and Computational Perspectives (pp. 15-38). Cambridge: Cambridge University Press.

Kreber, C., & Cranton, P.A. (2000). *Exploring the scholarship of teaching*. Journal of Higher Education (US). 71(4), 476-495.

Kumaravadivelu, B. (2012). *Language Teacher Education for a Global Society*. New York: Routledge.

Lai, E. (2011). *Collaboration: A Literature Review*, Pearson.

Lai, Y. C., & Ng, E. M. W. (2011). Using wikis to develop student teachers' learning, teaching, and assessment capabilities. *The Internet and Higher Education, 14*(1), 15-26.

Lambert, J. & Fisher, J. (2009). Wiki-based Distance Learning: Interpreting Effectiveness Through the Community of Inquiry Framework. In I. Gibson, R. Weber, K. McFerrin, R. Carlsen & D. Willis (Eds.), Proceedings of SITE 2009--Society for Information Technology & Teacher Education International Conference (pp. 429-434).

Lantolf, J. P. (2004). *Sociocultural theory and second language learning*. Oxford: Oxford University Press.

Lantolf, J.P. (2000). Second language learning as a mediated process. *Language Teaching*, 33, 79–96.

Lantolf, J.P. (2001). Sociocultural theory and SLA. In R. B. Kaplan (Ed.), *Handbook of applied linguistics* (pp. 109–119). Oxford: Oxford University Press.

Lather, P. (2006). Paradigm Proliferation as a good thing to think with: Teaching research in education as a wild profusion. *International Journal of Qualitative Studies in Education*, 19, 35-57.

Lee, C. J. G. (2012). Reconsidering Constructivism in Qualitative Research. *Educational Philosophy and Theory, 44*(4), 403-412.

Lincoln, Y. S., & Guba, E. G. (2000). Paradigmatic controversies, contradictions, and emerging confluences. In N. K. Denzin & Y. S. Lincoln (Eds.), *The handbook of qualitative research* (2nd ed., pp. 163–188). Beverly Hills, CA: Sage.

Linell, P. (1998). *Approaching dialogue : talk, interaction and contexts in dialogical perspectives*. Amsterdam: John Benjamins.

Lisbôa, E.S. and Coutinho, C.P. (2012) Virtual environment collaboration: interaction analysis based on Murphy's model, Paper presented at the European Conference on Educational Research 2012, Cádiz, Spain, 18–21 September.

Little, J. W. (1990). The persistence of privacy: Autonomy and initiative in teachers' professional relations. *Teacher College Record*, 91(4), 509-534.

Littleton, K. and Hakkinen, P. (1999). Learning Together: Understanding the Processes of Computer-Based Collaborative Learning. In Dillenbourg, P. (Ed*) Collaborative Learning: Cognitive and Computational Approaches* (pp.1-20). Pergammon Press, Amsterdam.

Lloyd, M. & Duncan-Howell, J. (2010). Changing the metaphor: The potential of online communities in teacher professional development. In J. O. Lindberg, & and A. D. Olofsson. (Eds.), *Online learning communities and teacher professional development: Methods for improved educational delivery* (pp. 60-76). New York: Information Science Reference.

Ludvigsen, S. R., Lund, A., Rasmussen, I., & Säljö, R (eds). (2011). *Learning across sites: New tools, infrastructures and practices*. New York: Routledge.

Lund, A. (2003). The Teacher as Inteface. Teachers of EFL in ICT-Rich Environments: Belief, Practices, Appropriation. Unpublished Doctoral dissertation, University of Oslo.

Lutrick, E., & Szabo, S. (2012). Instructional leaders' beliefs about effective professional development. *Delta Kappa Gamma Bulletin*, 78(3), 6-12.

Macià, M., & García, I. (2016). Informal online communities and networks as a source of teacher professional development: A review. *Teaching and Teacher Education*, 55, 291-307.

Mahapatra, SK (2015). 'Using Web 2.0 tools for teacher professional development: A case study'. In G Pickering and P Gunashekar (eds), *Innovation in English Language Teacher Education* (pp. 65-72) British Council.

Malm, B. (2009). Towards a new professionalism: enhancing personal and professional development in teacher education. *Journal of Education for Teaching, 35*(1), 77-91.

Mann, S., and Walsh, S. (2017). *Reflective Practice in English Language Teaching.* New York: Routledge.

Mansor, A. Z. (2012). Google Docs as a Collaborating Tool for Academicians. *Procedia - Social and Behavioral Sciences*, 59, 411-419.

Marstio, T., & Kivelä, S. (2014). Technology enhanced learning in a higher education context – Building bridges by student empowerment and regional development. *Nordic Journal of Digital Literacy*, 9(01), 66-87.

May, T. (1993). *Social research: issues, methods and process*. Buckingham: Open University Press.

McNiff, J. (1984) 'Action Research: a generative model for in-service support', *British Journal of In-Service Education*, 10 (3), Summer.

McNiff, J. and Whitehead, J. (2006). *All You Need to Know about Action Research*. London, Sage.

McNiff, J. (2013). *Action research: principles and practice* (3rd ed.). London: Routledge.

Mercer, N. (1995). *The Guided Construction of Knowledge: talk amongst teachers and learners*. Clevedon: Multilingual Matters.

Mercer, N. and Littleton, K. (2007). *Dialogue and the development of children's thinking: a sociocultural approach.* London, UK: Routledge.

Mertens, D. (1998). *Research and Evaluation in Education and Psychology: Integrating Diversity with Quantitative, Qualitative, and Mixed Methods.* London: SAGE.

Ministerio de Educación (MINEDUC) (2011). *Competencias TIC para la profesión docente*. Santiago: MINEDUC.

Ministerio de Educación (MINEDUC) (2016). *Ley N° 20.845 de Gratuidad Escolar*. Santiago: MINEDUC.

Ministerio de Educación (MINEDUC) (2017a). Diseño de un Plan de Desarrollo Profesional Continuo. Available form: http://liderazgoescolar.mineduc.cl/wpcontent/uploads/sites/55/2016/11/Dise%C3%B1o-de-un-Plan-de-DesarrolloProfesional.pdf.

Ministerio de Educación (MINEDUC) (2017b). *Estadísticas de la educación 2016 publicación agosto 2017*. Santiago: MINEDUC.

Ministerio de educación (MINEDUC) (2018a). Política Nacional Docente. Available from https://www.cpeip.cl/formacion-para-el-desarrollo-docente/

Ministerio de Educación (MINEDUC) (2018b). Modelo de formación para el desarrollo profesional docente y directivo. Santiago: MINEDUC.

Mitchell, R. (2013). What is professional development, how does it occur in individuals, and how may it be used by educational leaders and managers for the purpose of school improvement? *Professional Development in Education, 39*(3), 387-400.

Morales, S. (2015). 'How in-service language teachers become effective users of CALL for online teaching and learning: A case study of their development processes in a transformative online teacher training and development course'. Unpublished PhD thesis, Newcastle University. Available from: https://theses.ncl.ac.uk/dspace/bitstream/10443/3009/1/Morales%20Rios%2C%20S%202015.pdf.

Murphy, E. (2004). Recognising and promoting collaboration in an online asynchronous discussion. *British Journal of Educational Technology, 35*(4), 421-431.

Musanti, S. I., & Pence, L. (2010). Collaboration and Teacher Development: Unpacking Resistance, Constructing Knowledge, and Navigating Identities. *Teacher Education Quarterly*, 37(1), 73-89.

Ng, E. M. W. (2014). Using a mixed research method to evaluate the effectiveness of formative assessment in supporting student teachers' wiki authoring. *Computers & Education, 73,* 141-148.

Ng, E. M. W. (2016). Fostering pre-service teachers' self-regulated learning through self- and peer assessment of wiki projects. *Computers & Education*, 98, 180-191.

Nuñez, I. (2002). El profesorado, su gremio y la reforma de los noventa: presiones de cambio y evolución de la cultura docente. In C. Cox (Ed.), *Políticas educacionales en el cambio de*

siglo. La reforma del sistema escolar de Chile (pp. 455-518). Santiago: Editorial Universitaria.

Núñez, I. (1990). Reformas educacionales e identidad de los docentes. Chile, 1960-1973. *Programa Interdisciplinario de Investigaciones en Educación, PIIE* (Santiago).

Núñez, I. (1995). La educación chilena en el periodo 1945-1990. In C. L. y. A. Puiggrós (Ed.), *Historia de la Educación Iberoamericana 1945-1992* (Vol. 1, pp. 231-252). Buenos Aires: Miño y Dávila editores S.R.L.

OECD (2009), *Creating effective teaching and learning environments: First results from TALIS*, OECD, Paris.

Palloff, R. M., & Pratt, K. (2003). *The virtual student: A profile and guide to working with online learners.* San Francisco: Jossey-Bass.

Palloff, R. M., & Pratt, K. (2007). *Building online learning communities: effective strategies for the virtual classroom.* San Francisco: Jossey-Bass.

Palloff, R. M., & Pratt, K. (2008). *Assessing the online learner: Resources and strategies for faculty.* San Francisco, CA: Jossey-Bass.

Parada, J. (2013). Diseño de un sitio web del tipo LMS para fomentar la inclusión digital de profesores de inglés y alumnos de colegios subvencionados de la Comunda de La Serena Unpublished Med thesis, Pontificia Universidad Católica de Chile (UC).

Parrott, M. (1993). *Tasks for language teachers: A resource book for training and development*. Cambridge [England]; New York: Cambridge University Press.

Patton, M. Q. (2002). *Qualitative Research & Evaluation Methods* (3rd ed.). Sage Publications, Inc.

Plencia, R. (2015). Efectos de una estrategia didáctica que integra el uso de una plataforma tecnológica para la ganancia de aprendizajes matemáticos en alumnos de 6° básico. Unpublished Med thesis, Pontificia Universidad Católica de Chile (UC).

Ponte, P., Ax, J., Beijaard, D., & Wubbels, T. (2004). Teachers' development of professional knowledge through action research and the facilitation of this by teacher educators. *Teaching and Teacher Education, 20*(6), 571-588.

Prestridge, S. (2017). Conceptualising self-generating online teacher professional development. *Technology, Pedagogy and Education, 26*(1), 85-104.

Prestridge, S., & Tondeur, J. (2016). Exploring Elements That Support Teachers Engagement in Online Professional Development. *Educ. Sci*. 2015, 5, 199–219.

Punch, K. (2009). *Introduction to research methods in education*. London: SAGE.

Rasmussen, I. (2005). *Project Work and ICT Studying Learning as Participation Trajectories.*, University of Oslo, (46).

Rebolledo, C. (2013). Exploring action research on a professional development course in Chile. Unpublished PhD thesis, University of Leeds. Available from http://etheses.whiterose.ac.uk/5777/1/Thesis_Paula%20Rebolledo.pdf.

Rebolledo, P., Smith, R. and Bullock, D. (eds) (2016). *Champion Teachers: Stories of Exploratory Action Research*. London: The British Council. Online (Open Access).

Richards, J. C., & Farrell, T.S.C. (2005). *Professional development for language teachers*. New York: Cambridge University Press.

Riessman, C.K. (1993). *Narrative Analysis*. Qualitative Research Methods Series, No. 30. Newbury Park, CA: Sage.

Rodesiler, L. (2017). For Teachers, by Teachers: An Exploration of Teacher-Generated Online Professional Development. *Journal of Digital Learning in Teacher Education, 33*(4), 138-147.

Rogoff, B. (1995). Observing sociocultural activity on three planes: Participatory appropriation, guided participation, and apprenticeship. In J.V. Wertsch, P. del Rio, & A. Alvarez (Eds.), *Sociocultural studies of mind* (pp. 139-164). Cambridge, UK: Cambridge University Press.

Rojas, P. (1998). Remuneraciones de los Profesores de Chile. *Estudios Publicos, N.71*. Santiago; pp. 121-175.

Roschelle, J. & Teasley, S. D. (1995). *The construction of shared knowledge in collaborative problem-solving*. In C.E. O'Malley (Ed.), Computer-supported collaborative learning (pp. 69–97). Berlin: Springer-Verlag.

Salajan, F. D., Nyachwaya, J. M., Hoffman, J. G., & Hill, B. D. (2016). Improving Teacher Candidates' Lesson Planning Competencies Through Peer Review in a Wiki Environment. *The Teacher Educator,* 51(3), 185-210.

Salmon, G. (2000). *E-Moderating: The Key to Teaching and Learning Online*. London: Routledge Falmer.

Scardamalia, M. (2002). Collective cognitive responsibility for the advancement of knowledge. In B. Smith (Eds.), *Liberal education in a knowledge society* (pp. 76-98). Chicago: Open Court.

Scardamalia, M., & Bereiter, C. (2006). Knowledge building: Theory, pedagogy, and technology. In K. Sawyer (Ed.), *Cambridge Handbook of the Learning Sciences* (pp. 97-118). New York: Cambridge University Press.

Schön, D. A. (1983). *The Reflective Practitioner: How professionals think in action*. London, United Kingdom: Temple Smith.

Schön, D. A. (1987). Teaching artistry through reflection-in-action. *In educating the reflective practitioner* (pp. 22-40). San Francisco, CA: Jossey-Bass Publishers.

Schwartz, D. L. (1999). The productive agency that drives collaborative learning. In P. Dillenbourg (Ed.), *Collaborative learning: Cognitive and computational approaches* (pp. 197-218). New York: Elsevier Science.

Scott, S. (2010). The theory and practice divide in relation to teacher professional development. In: Lindberg, J. O. (Ed.), *Online Learning Communities and Teacher Professional Development: Methods for Improved Education Delivery*, (pp.20-40). Hershey, PA: IGI Global.

Shabani, K. (2016). Applications of Vygotsky's sociocultural approach for teachers' professional development. *Cogent Education, 3*(1), 1252177.

Sikes, P. (2010). The Ethics of Writing Life Histories and Narratives in Educational Research. In Bathmaker, A. & Harnett, P. (Eds.*). Exploring Learning, Identity and Power Through Life History and Narrative Research* (pp.11-24). London, Routledge/Falmer.

Smith, R. and Rebolledo, P. (2018). *A Handbook for Exploratory Action Research*. London: The British Council. Online (Open) Access.

Smith, R. (2015). Exploratory action research as workplan: why, what and where from? In Dikilitas, K. and Smith, Richard and Trotman, W., (eds.) *Teacher-researchers in Action* (pp. 37-45*)*. IATEFL Research Special Interest Group.

Smith, R., Connelly, T. and Rebolledo, P. (2014). Teacher-research as CPD: A project with Chilean secondary school teachers. In *Innovations in the Continuing Professional Development of English Language Teachers* (pp.111 – 128). Editors: Hayes, D., London: The British Council.

Somekh, B. (2006). *Action Research: a methodology for change and development*. Buckingham: Open University Press.

Somekh, B. (2010). The Collaborative Action Research Network – 30 Years of agency in developing educational action research. *Educational Action Research* 18(1) pp 103-121.

Srinivas, M. (2015). Located' teacher education: Redesigning the curriculum of a teacher training programme from a socio-cultural perspective. In G. Pickering and P. Gunashekar (eds), *Innovation in English Language Teacher Education* (pp. 147-153). British Council.

Stahl, G. & BSCW Development Group (2003). Knowledge Negotiation in Asynchronous Learning Networks. HICSS '03: Proceedings of the 36th Annual Hawaii International Conference on System Sciences (HICSS'03) - Track1 (pp. 3.1). Washington, DC, USA: IEEE Computer Society.

Stahl, G., Koschmann, T., & Suthers, D. (2006). Computer-supported collaborative learning: An historical perspective. In R. K. Sawyer (Ed.), *Cambridge handbook of the learning sciences* (pp. 409–426). Cambridge, UK: Cambridge University Press.

Strampel, K., & Oliver, R. (2007). *Using technology to foster reflection in higher education. In ICT: Providing choices for learners and learning*. Proceedings ascilite Singapore 2007.

Thomas, D. R. (2006). A General Inductive Approach for Analyzing Qualitative Evaluation Data. *American Journal of Evaluation, 27*(2), 237-246.

Thompson, I. (2013). The Mediation of Learning in the Zone of Proximal Development through a Co-constructed Writing Activity. *Research in the Teaching of English*. 47 (3), pp. 247-276.

Titscher, S., & Jenner, B. (2000). *Methods of text and discourse analysis*. London: SAGE.

Tondeur, J., N. Pareja Roblin, J. van Braak, J. Voogt and S. Prestridge (2017). Preparing beginning teachers for technology integration in education: ready for take-off? *Technology, Pedagogy and Education* 26(2): 157-177.

Underwood, J., & Underwood, G. (1999). Task effects on co-operative and collaborative learning with computers. In K. Littleton & P. Light (Eds.), *Learning with computers: Analysing productive interaction (pp*. 10-23). Florence, KY: Psychology Press

UNESCO (2017). *Supporting teachers with mobile technology*. United Nations Educational, Scientific and Cultural Organization. Available from: http://unesdoc.unesco.org/images/0025/002515/251511e.pdf

Valli, L. (1997). Listening to other voices: A description of teacher reflection in the United States. *Peabody journal of Education*, 72 (1), 67-88.

Vygotsky, L. (1986). *Thought and language* (A. Kozulin, Trans.). Cambridge, MA: The MIT Press. (Original work published 1934).

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, Mass.: Harvard University Press.

Vygotsky, L. S. (1981). The development of higher forms of attention in childhood. In J. V Wertsch (Ed.), *The concept of activity in Soviet psychology* (pp. 189-240). Armonk, NY: Sharpe.

Van Oers, B. (1998). From context to contextualizing. *Learning and Instruction, 8*(6), 473-488.

Wallace, M. J. (1991). *Training foreign language teachers: A reflective approach*. Cambridge: Cambridge University Press.

Wells, G. (2000). Dialogic inquiry in education: building on the legacy of Vygotsky. In Lee CD & Smagorinsky P (eds) (2000) *Vygotskian perspectives on literacy research: constructing meaning through collaborative inquiry* (pp 51–85). Cambridge/New York: Cambridge University Press.

Wenger, E. (1998). *Communities of practice: learning, meaning, and identity*. Cambridge: Cambridge University Press.

Wenger, E., White, N, & Smith, J.D. (2009). *Digital Habitats: stewarding technology for communities*. Portland, OR: CPsquare Publishing.

Wertsch, J. (1998). *Mind as action.* New York, NY: Oxford University Press.

Wertsch, J. V (1991). *Voices of the mind: A sociocultural approach to mediated action*. Cambridge, MA: Harvard University Press.

Wheeler, S., & Wheeler, D. (2009). Using wikis to promote quality learning in teacher training. *Learning, Media and Technology, 34*(1), 1-10.

White, S., Fook, J., & Gardner, F. (2006). Critical reflection: a review of contemporary literature and understandings. In S. White, J. Fook, & F. Gardner (Eds.), *Critical reflection in health and social care*. (pp. 3-20). Maidenhead: Open University Press.

Whitehead, J. (1985). A dialectician responds to a philosopher who holds an orthodox view of knowledge. *Assessment and Evaluation in Higher Education,* 10(1); 35-52.

Whitehead, J. (1989). Creating a Living Educational Theory from Questions of the Kind, 'How do I Improve my Practice?' *Cambridge Journal of Education*, 19(1), 41-52.

Wright, T. & R. Bolitho (2007). *Trainer Development*. www.lulu.com.

Wright, T. (2005). *Classroom Management in Language Education*. Basingstoke: Palgrave Macmillan.

Wright, T., & Beaumont, M. (eds) (2015). *Experiences of second language teacher education*. Manchester, United Kingdom, Palgrave Macmillan.

Zittoun, T., & Gillespie, A. (2015). Internalization: How culture becomes mind. *Culture & Psychology, 21*(4), 477-491.

Appendices

APPENDIX 1: THE WIKI PROJECT PROFESSIONAL DEVELOPMENT (PD) ACTIVITIES

Teachers' Professional Development Activity Bank
By Miguel Cerna, October 2018

1. **About action research**

Objective: to inform and instruct about action research and exemplify how action research has been approached in a Chilean context.

Procedures:

1. Ask teachers what they know about action research and invite them to explain their experiences with action research.

2. Show them a spreadsheet (See appendix 2: PD material A) which explains in detail the action research basic cycle; identification, planning, action and reflection (adapted from McNiff and Whitehead 2006; Altrichter et al. 1993).

3. Invite teachers to ask questions and explain about action research experiences in Chile.

2. **Pictures for reflection**

Objective: to frame the identification of the teachers´ classroom problem.

Procedures:

1. Show four pictures to the teachers with different classroom settings. (See appendix 2: PD material B)
2. Ask teachers about their perception of the pictures, and ask if they relate to one in particular, and why?
3. Weave their perception towards a classroom problem and invite teachers to think about the classroom problems affecting their practices.

3. Create a metaphor

Objective: to activate the topic of the conversation "classroom problems", and to encourage teachers to think about positive or negative perceptions of their teaching practices by creating a metaphor for their classroom.

Procedures:

1. Read examples of metaphors. For example; *The schools as factories for learning.* There are pupils in rows, bells to limit times, and certain standards to achieve. Grades help to measure quality, and teachers are like bosses who guide productivity. (Bull, 2013). (See appendix 2: PD material B)
2. Invite teachers to create a metaphor for their classroom.
3. Discuss why they have created that metaphor and highlight the positive and negative aspects of their metaphor.

4. Narrate a problem

Objective: to provide a supportive opportunity for the teachers to identify a classroom problem(s), and an issue of investigation in collaboration with other.

Procedures:

1. Explain teachers that they are going to speak freely about a problematic situation in their classrooms. Explain that the problematic situation can be related to any area of their teaching practices. For example, planning, classroom management, evaluation, etc... Make sure not to interrupt teachers when they start their narrations.
2. Once teachers have finished, ask them to focus on one area if possible, and ask them to expand their explanations.
3. Once a problematic area has been highlighted, work with teachers in clarifying the existing problematic situation. i.e. what is the nature of the given 'problem'? What have you done to improve the problem? What is the core of the problem?
4. Finally, discuss aspects of the problem the teacher explained, and ask for confirmation regarding his/her interest.

5. Writing in a Wiki:

Objective: to instruct on how to use a google. Doc wiki to gather information contributed by many participants in one place.

Procedures:

1. Show them a google. Doc wiki to explain how it can be used and the main purposes of it. (See appendix 2: training material C)
2. Explain how to interact in a wiki by explaining the use of colours, fond, pictures, and links.
3. Explain about the main objectives of a social wiki and a problem-solving wiki.

6. My profile

Objective: to help teachers to introduce themselves in an online environment.

Procedures:

1. Tell teachers they will create an on online profile to share with all the participants of the study.
2. Show them a sample and emphasise that the profile is critical for getting to know the other teachers. (See appendix 2: training material C)
3. Mention the minimal aspect they should include in their profile. For example, name, ideally a photo, the subject they teach, professional interests, information about schools, hobbies, etc.
4. Explain teachers they will receive a link where to complete their profile in a couple of days.

7. Hello group

Objective: to make participants interact in a social environment.

Procedures:

1. Sent an email inviting teacher to greet the participants in the social-wiki and ask questions regarding their profiles.
2. Be the first to add comments at the end of the profiles to promote participation and motivation.

8. Thinking questions

Objective: to help teachers to elicit reflective practice and help them to organize their reflexivity.

Procedures:

1. In an interview explain the importance of reflection. Get inspiration from this definition.

The importance of reflection

As you work through the activities and ideas in this project, you will naturally spend time reflecting on them, considering what's good about them and how they might be improved. This reflection will influence your own ideas and help you to develop successful activities that build on your experience of what works well with your learners. By reflecting on your learning and experience you'll be able to build on your present knowledge and extend it. As you extend your knowledge, you'll want to experiment with new approaches, and this will influence how you decide to develop your teaching in the future.

Reflection can occur at any time. It may be while you write in the wiki or it may happen as you prepare or deliver your own lessons. In fact, a very good time for reflection is after a lesson, and it is good practice to record your thoughts once you've finished. Emails can help you achieve this process! (adapted from CiSELT, 2012)

2. Explain the email mechanism (one email at the end of each stage to organize and elicit reflexivity). Invite teachers to share their email with you if they want.
3. Include prompt questions in each email. For example, what did I learn in this stage? What was the most significant of this stage?

9. Let's work together

Objective: to organize the collaborative work and motivate teachers to work in collaborative teams.

Procedures:

1. Send the profiles of the members of each team in an email. Include motivational words in your email. For example, I am really happy to confirm the team arrangements. Your group is diverse and includes 4 teachers from different backgrounds and school context.
2. Create the problem-solving wikis and include the problems teachers have identified as important for them. Present the problems as a generic situation and include a question to summarize the main issue of the situation described. Use different fond, colours and capitalization to highlight the key aspects of problem. Add the names of the teachers conforming the team in the main heading and invite participants to add their contributions. Use the invitation tool available and invite them to edit.
3. Be the first to add one contribution in the wiki to motivate participation if participation do not flow naturally.

10. Final strategies: summary

Objective: to present in a clear way the action strategies for implementation.

Procedures:

1. Send individual emails with the action strategies discussed for each specific problem to the teachers.
2. Invite teachers to apply the strategy (s) they consider more effective for their problem.
3. Invite teachers to email you the strategies they have selected for implementation.

11. Linking theory-practice

Objective: prepare and support teachers for the future implementation.

Procedures:

1. Share relevant literature regarding the problem the teachers will work with. (articles, websites, etc)
2. Share supporting material with the participants based on the strategies identified (e.g news, lesson plans, photos, books, videos, etc)
3. Send the thinking questions

12. Implementation support

Objective: to support participants in their implementation.

Procedures:

1. Send individual emails to the participants offering support in their implementation.
2. Send thinking questions.

13. Final narration

Objective: to provide an opportunity for the participants to speak freely about the implementation of their project, and the impact for their professional development.

Procedures:

1. Explain the objective of the activity. Teachers are going to speak freely about the implementation of their project, and the impact it has for their professional practices. Make sure not to interrupt teachers when they speak.
2. Activate the topic of the conversation by showing pictures or invite them to create a metaphor.
3. Invite teachers to start their narrations, once teachers have finished, ask questions regarding their feeling with problems and possibilities of their implementation and research process in general.
4. Invite teachers to mention different aspects aspect they consider important.

14. Ping pong of ideas

Objective: To unveil the teachers first though regarding the work done.

Procedures:

1. Invite teachers to a game where they say the first word that came to their minds when you mention words related to the action research project. For example, Wiki, interview 1, action, implementation, etc.…
2. Take notes of their words and invite them to explain the reasons of their words
3. Send the reflective questions.

PD: professional development

References

Altrichter, H., Posch P. & Somekh, B. (1993). Teachers investigate their work. An introduction to the methods of action research. London: Routledge

Bull, B. (2013) Schools as Factories? Alternative Metaphors for Thinking about Digital Age Schooling. Retrieved from: http://etale.org/main/2013/02/25/schools-as-factories-15-alternative-metaphors-for-thinking-about-digital-age-schooling/

CiSELT (2013) British council The Certificate in Secondary English Language Teaching. Retrieved from: https://www.britishcouncil.cl/en/teach/courses/ciselt.

McNiff, J. and Whitehead, J. (2006) *All You Need to Know about Action Research.* London, Sage.

Rebolledo, P, Smith R. & Bullock, D. eds. (2016) *Champion Teachers: stories of exploratory action research.* London: The British Council. ISBN 9780863558078.

APPENDIX 2: PROFESSIONAL DEVELOPMENT MATERIAL

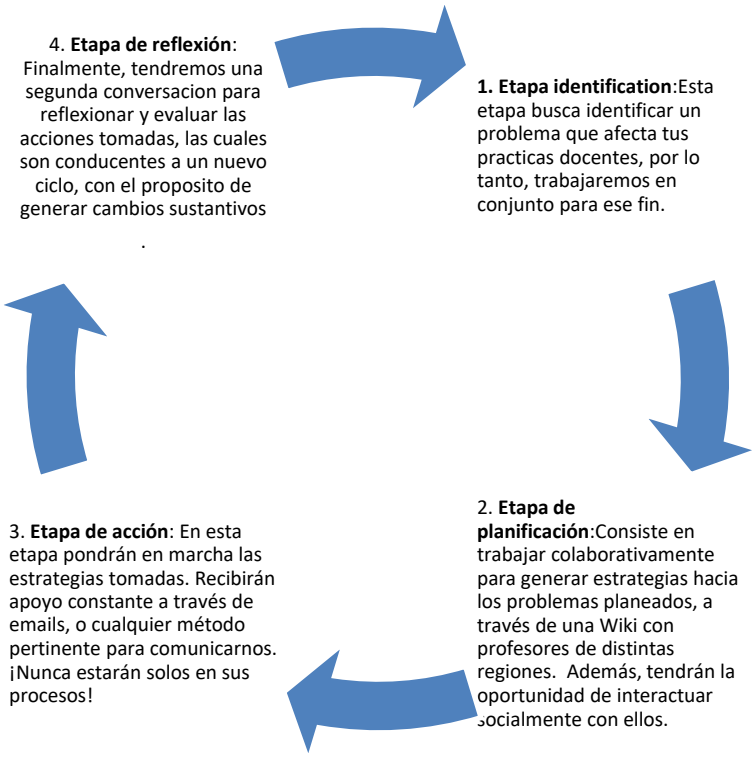
A) Action research information for the teachers

Investigación-Acción

La **Investigación-Acción** es una metodología educativa que busca solucionar los problemas en el aula, así como también la producción de nuevos conocimientos. Este tipo de investigación suele tomar distintos nombres tales como investigación en el aula, profesor investigador, investigación colaborativa, etc. Todas ellas enfatizan la noción de cambio o mejoramiento de una situación crítica o problema educacional.

El método de **Investigación-Acción** sigue un ciclo en etapas las cuales se enfocan en la exploración de problemas en el aula o de cualquier ámbito profesional, seguido de la planificación de estrategias de acción las que son implementadas y sometidas más tardes a observación, reflexión y cambio.

El siguiente diagrama explica en forma general los procesos de investigación acción, estos procesos no se dan en forma lineal sino cíclica. Por los tanto, esta ilustración solo representa las etapas temáticas y las acciones que llevaremos a cabo durante este proyecto.



El proceso de investigación acción (adaptado de Kemmis and McTaggart (2000) Elliott (1991) y McNiff (2013))

Como podemos apreciar, todo comienza con la **identificación** de la problemática de interés. Razón por lo cual, es importante entender las razones que originan nuestro problema y de

esta forma trabajar de forma pertinente y focalizada. La etapa de **planificación** se enfoca en el trabajo colaborativo y reflexivo para encontrar soluciones y crear estrategias para mejorar estas situaciones. En este proceso suelen basar sus propuestas en literatura académica, artículos, libros, investigaciones, conversaciones, búsquedas en internet, etc. y así enfrentar los cambios con fundamentos sólidos. La tercera etapa, **Acción** busca poner en marcha las estrategias discutidas. Es en esta etapa cuando el cambio o mejora es puesto en práctica. Un componente importante de la acción es la documentación de aspectos relevantes generados debido al cambio. Acá el uso de un diario para tomar nota de nuestro proceso de aprendizaje toma mayor relevancia. Finalmente, tenemos la etapa **reflexiva**, la cual busca evaluar los procesos y cambios efectuados. Esta etapa conduce a un nuevo ciclo el cual se enfoca en un nuevo problema o redefinición del anterior.
Miguel Cerna, 2015.

B) Narrative activity and photos

In Semi-structured Interview one

Initiation

1. Look at the following pictures and give me your impressions.

2. What do you think about these metaphors?
   Metaphors
   Education is not preparation for life; education is life itself ~John Dewey
   A child educated only at school is an uneducated child. ~George Santayana
   Education is gardening
   Can you think about a metaphor for education?

Main narration

3. I would like you to speak freely about the following topic" These are some of the problems I face in my class"

Questioning phase

4. What happened then?
5. Can you provide further perspectives on that issue?

Concluding phase (active questioning)

6. Why do you think this problem is so important?

5. Is there any specific problem that you would like to explore? Can you tell me about it?

7. What have you done to solve the problem?

Semi-structured Interview two

Initiation

1. Look at the following pictures and give me your impressions. What do you think these pictures are related to?




2. What do you think about these metaphors?
   Metaphors/thoughts
   "Alone we can do so little; together we can do so much" — Helen Keller
   "Life can only be understood backwards; but it must be lived forwards." — Søren Kierkegaard
   "I am not what happened to me, I am what I choose to become." — C.G. Jung

Main narration

3. I would like you to speak freely about your experience in the project.

Questioning phase

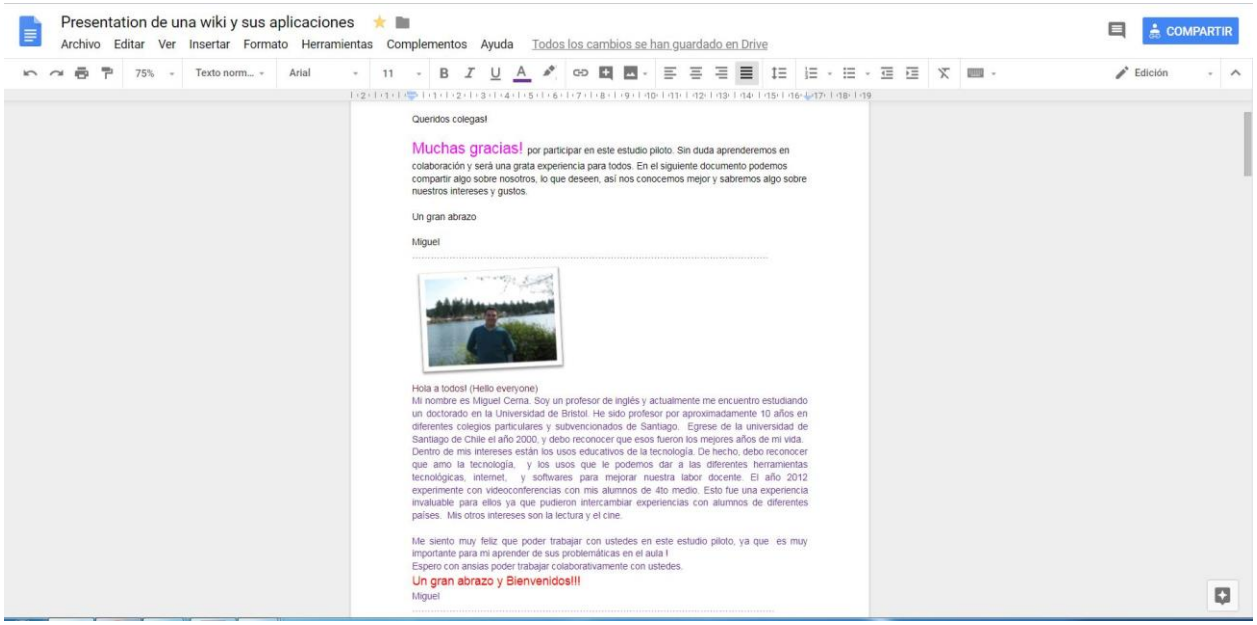
4. What happened then?
5. Can you provide further perspectives on that issue?

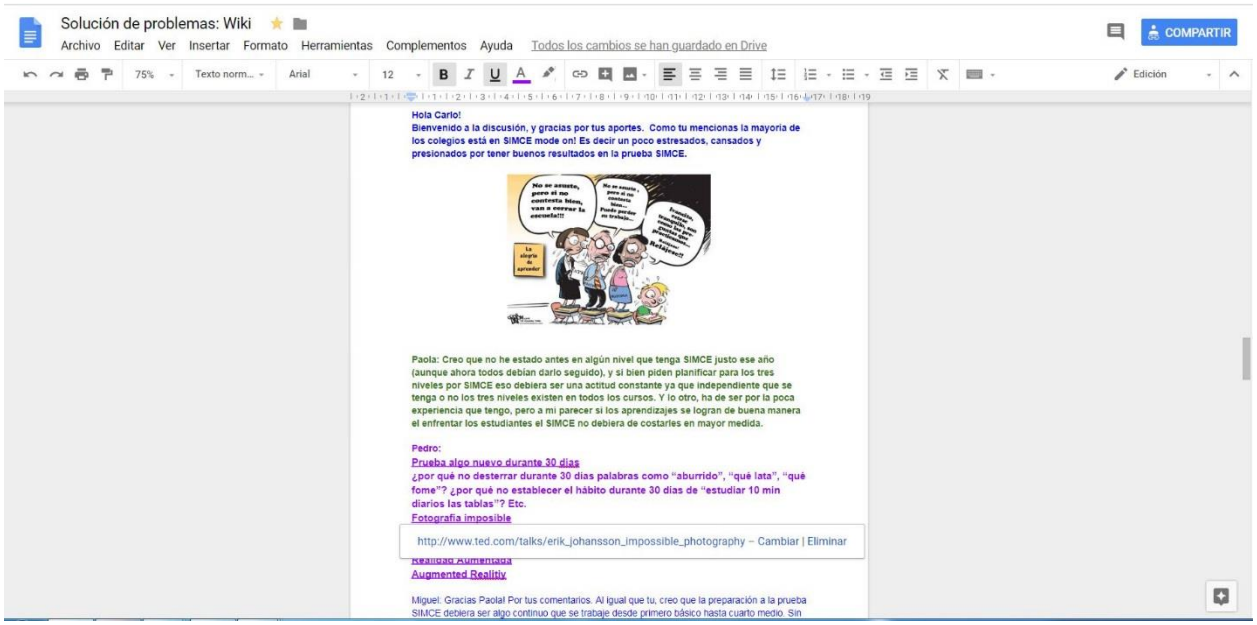
Concluding phase (active questioning)

6. What have you learnt from the situation?
7. What was the most challenging aspect?
8. What was the most significant aspect for you?
9. What would you have you done differently?
10. How the experience affected your personal innovations?
11. What were the aspects (if any) that opened new perspectives as a teacher?
12. What do you think about the activities proposed?

C) Working in a Wiki

Sample screenshots used to explain the use of the wikis to teachers





APPENDIX 3: ETHICAL GUIDELINES

GSOE RESEARCH ETHICS FORM

It is important for members of the Graduate School of Education, as a community of researchers, to consider the ethical issues that arise, or may arise, in any research they propose to conduct. Increasingly, we are also accountable to external bodies to demonstrate that research proposals have had a degree of scrutiny.

The GSoE's process is designed to be supportive and educative. If you are preparing to submit a research proposal, you need to do the following:

1. **Arrange a meeting with a fellow researcher**
   The purpose of the meeting is to discuss ethical aspects of your proposed research, so you need to meet with someone with relevant research experience, perhaps from your CLIO centre. A list of prompts for your discussion is given below. Not all these headings will be relevant for any particular proposal.
2. **Complete the form on the back of this sheet**
   The form is designed to act as a record of your discussion and any decisions you make.
3. **Send a copy of the completed form to Keren Durant/ Valerie Aspin, Research Office.** You should also keep a copy for yourself. The forms will be kept until your research project has been completed. Forms may be looked at by the GSoE's ethics forum in order to identify training needs, for example.

If you need formal 'clearance' for a prospective funder, please contact the GSoE's ethics co-ordinator (currently Wan Ching Yee).

Please ensure that you allow time before any submission deadlines to complete this process.

Prompts for discussion

You are invited to consider the issues highlighted below and note any decisions made. You may wish to refer to relevant published ethical guidelines to prepare for your meeting. See www.bris.ac.uk/education/ethicnet for links to several such sets of guidelines.

1. Researcher access/ exit
2. Information given to participants
3. Participants right of withdrawal
4. Informed consent
5. Complaints procedure
6. Safety and well-being of participants/ researchers
7. Anonymity/ confidentiality
8. Data collection
9. Data analysis
10. Data storage
11. Data Protection Act
12. Feedback
13. Responsibilities to colleagues/ academic community
14. Reporting of research

Be aware that ethical responsibility continues throughout the research process. If further issues arise as your research progresses, it may be appropriate to cycle again through the above process.

Name(s): Miguel Angel Cerna Caceres
Proposed research project: The Role of Online Collaborations to Generate a Continuous Professional Development Experience in Primary and Secondary Schools across Chile.
Proposed funder(s): Becas Chile (Chilean Government scholarship)
Discussant for the ethics meeting: Dr. Jane Reece, former EdD student from Bristol University (Jane.Reece@bristol.ac.uk)

Please include an outline of the project or append a short (1 page) summary.

This study aims at exploring the possibilities, challenges, and teachers' perceptions of a technology-enhanced model of continuous professional development (CPD). *The main purpose of this research is to explore and gain further understanding about how technology can mediate the reflective, collaborative and experiential processes, and if leading to CPD experiences.* To achieve this end, this study plans a four-month online action research methodology with a group of 12 Chilean teachers from different regions of the country. The teachers will follow an action research cycle of four stages.

First, the participants will start with the ***exploration phase*** that aims to recognize the problem(s) in their teaching practices. A narrative interview approach to exploring teachers' problems will be the data collection methods of choice. Teachers will also be giving the chance to get further insights on their problems by interviewing their students, revising teaching material or speaking with theirs school colleagues. This phase will start in July 2015 in Chile to promote engagement, support and confidence towards the study.

The ***planning stage*** will provide teachers with an opportunity to (a) analyse and reflect on their original problems and, (b) designing problem-solving collaborative strategies and a time plan which are relevant for them as a group and individuals. This stage will start in August 2015 and it will be online through a wiki and email as it seeks to gather data regarding reflective and collaborative practices in online environments. Then, in the ***action phase***, teachers will implement their ideas and plans to generate a significant change in their teaching practices and to assess future positive, negative or unforeseen effects of what they have considered as problematic. Teachers will be connected through emails, skype and wikis to avoid the sense of isolation, and to provide support in different aspect of the implementation. This stage will take place in August/September 2015.

Finally, in the ***reflection phase*** teachers will reflect and evaluate the actions taken so far. A second narrative interview online, and the use of reflective emails are the technological tools that aim to promote reflective thinking in teachers, as well as to gather data regarding the nature of their reflections and the value they gave to the ICT experience. This stage will take place in October 2015. After that a series of loops will continue the implementation during November.

Ethical issues discussed and decisions taken (see list of prompts overleaf):

In a meeting held on February 17, 2015 with Dr. Jane Reece we discussed the 14 ethical issues suggested. We covered from the research access to reporting the research. These are the main ethical aspects and decision taken after that conversation.

Researcher access

We discussed that Chilean teachers have heavy workloads. So, teachers frequently feel exhausted and with mental fatigue after a long school day which is usually complemented with parents' meeting, interviews or test corrections. Thus, getting access to teachers can be a bit difficult as they may feel that they do not have time to participate, or they just have other responsibilities. We discussed about the best ways to motive and engage teachers in the project. These are some of the conclusions to ensure the implementation works;
(a) **Motivation and engagement:** Provide clear information about the benefits of their participation for their practices. For example, it can help them to update their methodologies, share material with other teacher, networking, become a researcher, etc.
(b) **Work in collaboration:** Make the teachers clear that they will be supported during all the implementation. I have to explain the collaborative aspects this project encompasses, and how they can make it extensive to their colleagues in teachers meeting, in a bulletin board, through informal conversations, etc.
(c) **Formality:** Explain that at the end of the study, they will receive a certificate of participation in an action research project. I have to make clear that this certificate is not a certification but a recognition to their engagement. Teachers can write in their CVs that they know about action research, and how to implement it. If teachers are interested but need authorization of the headmaster. I can visit their schools and explain the impact the project in the teachers' performance.
(d) **Avoid pressure**: this study aims at approaching professional development as something easily achieved with the use of technologies at hand. Teachers will exchange information through email, Google share documents, and skype- or other webcam application they feel comfortable with. These tools are already available for teachers and they will not need further training or guidance. However, I will make sure to contact them and clarify any questions regarding technological issues.
To lessen time pressure, the action research cycles will be organized with time, so they teacher do not feel pressured or stressed. For example, the first stage of the action research ***exploration*** will last for approximately 15 days, and the other stages will vary in length depending on the teachers work.

Complain procedure

Action research is a collaborative endeavour, and as such it has attached the complexity of interrelationships. Thus, participants may disagree regarding the rationale of the problems discussed, or they can adopt defensive attitudes towards learning in collaboration. These are some of the conclusions to ensure the complaints procedure works;
(a) Make clear that the participant can write to miguel.cernacaceres@bristol.ac.uk in case they want to complain about any issue. (only me? Marina makes a point on this)
(b) Send a reminder (every 15 days) asking them if they have any problem, issue or misunderstanding.

(c) To prevent complains the researcher needs to inform about all the changes, and new action to all the participants, in a transparent, professional and clear way. This may generate a better attitude and it may help me to face complaints in a professional way as well.

Informed consent

Getting consent is a challenging aspect. In fact, the online environment stands as a barrier, because participants may not open their emails for weeks, or may decide to answer at a later date. For these reasons, we discussed these possibilities to ensure an informed consent;

(a) Be in Chile and contact the participant directly and if possible to schedule an informal interview with them in their workplace, café, house, etc. This may trigger confidence. Therefore, that the participant is clearer about their consent.

(b) The evolving nature of action research prevents that participants give consent in advance. This fact can generate complications if a new narrative interview or wiki were needed. We discussed the idea of providing "process consent" i.e. consent that it is ongoing and requires renewal as the stages evolve**.**

(c) In case that a face-to-face consent is not possible. Phone conversation, skype, of video conferences are good options to inform and get the participants involved.

Anonymity and confidentiality

Anonymity can be secured by assigning a pseudonym to the participants in the research study. However, there is always a vulnerable point regarding the participants' friends, acquaintances, and collages who knows about the research process and may identify the participants' ideas and comments. Regarding confidentiality of data, the wiki activity through Google Doc. is an open platform and different people can get the link. This may generate complications if the link is shared with someone alien to the research. We commented on these problems and I plan to implement these strategies to ensure anonymity and confidentiality

(a) Inform the participants that some of their comments will be included in the research without disclosing their identities, and that they can ask for a copy of the research once it is finished.
(b) Ask the participant to create an alias in the wikis, so people cannot identify their names.
(c) Explain the participant about the problems it may carry to share the link with alien people in terms of privacy and respect for their colleagues. This may generate a respectful attitude that can lessen the possibility of sharing the link.

Data storage

There will be a considerable amount of data from the interview, wikis and email circulating in the web. To secure that the data is safe, we discussed these actions;

(a) All the data will be store in the university O-drive

(b) All the email and wikis will be sent from the researcher university account miguel.cernacaceres@bristol.ac.uk.

© The data will be destroyed 3 months after the completion of the dissertation.

Safety and well-being of participants/ researchers

To ensure the participants' well-being during and after the research. We discuss to apply a reflective and ethical strategy during all the research process. This strategy involves;

My capacity to acknowledge how my own experience and context inform the process of and outcomes of the study. Thus, I have decided to adopt Gibbs' reflective cycle "make pertinent decisions with adequate reflection or analysis" (Gibbs 1988: 46-48), and to understand my researcher positionality in interviews or clarify my researcher bias. I will follow this model when I face ethical and research concerns. I will keep a record of my thoughts and findings in a reflective log. This reflective log will help me to visualize the progress of the research and the potential problems participant may face in some stages.

APPENDIX 4: CONSENT FORM

Consent form

I have been invited to participate in the PhD study of Miguel Angel Cerna Caceres about collaborative and reflexive practices in online environments. I am participating voluntarily

I give permission for my interviews to be tape-record and take notes. I understand that I can withdraw from the study, without repercussions, at any time, whether before it starts or while I am participating.

I understand that anonymity will be ensured in the write-up by disguising my identity.

I understand that disguised extracts from my interview may be quoted in the thesis and any subsequent publications if I give permission below:

Please, mark with a cross your choice

❒ I agree to quotation/publication of extracts from my interview

❒ I do not agree to quotation/publication of extracts from my interview

I have read the information document, and I have had the opportunity to ask all the necessary questions about the process of the investigation. I feel I have relevant information to participate in this study and I give my consent to participate.

Name:…….….

Signature……. Date…….

About the researcher

I have sent the information sheet to the participants. I have made sure that the participant understands all the processes of the research. I can confirm that the participant had the opportunity to make questions, and that all the questions were answered. The participation is voluntary, and he/she has not been forced to give his/her consent.

Name: …….

Signature…….

APPENDIX 5: CODING FRAME SAMPLES FROM TRAJECTORIES AND INTERACTIONS

A. Transcribed version figure 4.10 for clarity

Fernanda Shows professional interest Manifests knowledge on classroom management Makes sense of my orientations Shows her reflexivity * kind of descriptively Expresses socio-educational responsibilities for her learning Recognizes challenges in her practice Opens to learning by receiving support Establishes trust and acceptance with others Describes problems Satisfies her own needs Commits to improve professionally Shows awareness and professional autonomy Evaluate aspects of her teaching Works resourcefully with teachers Finds ways to participate in a professional community Builds professional relationships Describe aspects of her practice *reflection **Danitza** Shows love for teaching *vocation Manifests knowledge in Student's learning styles and methodological flexibility Shows responsibility towards others Manifests her professional autonomy Adapts to adverse teaching situations Connect with other in emotional terms Shows herself interested in the teaching profession Clarifies her ideas in online environments Shows herself assertive, diligent, attentive and supportive Builds trust and manifests social attributes Manages up-to-date information towards her profession Plans and predicts challenging events Simplifies contents for her students Follows a course of action Manifests professional relationships Shows collaborative attitudes e.g. thanks for assistance Identifies her weaknesses Shows positive attitudes to share personal perspectives Reflects on her actions and actions of others Shows mindfulness by questioning her actions. **Camila** Makes explicit aspects of importance Simplifies processes of productivity online Guides others for clarity Manifest leadership features Shows respectful towards others Shows her reflexivity more critically Shows commitment towards her institutions Appropriate aspects of the contexts for her development Guide other teachers Links her ideas with theory Makes information available to others Manifests professional confidence to express concerns Manifests intentions to build a professional community Expresses knowledge on her socio-cultural context of teaching Negotiates access and shows managerial skills Sets boundaries for her research Uses various resources	**"Camila"** **Planning** Has a focus to investigate/has a clear aim Outlines clearly the planning process Makes methodological decisions Sets boundaries on what to do Negotiates access with others Adopts strategies to prevent problems Plans with an inclusive aim **Action** Monitors action Encourages participation Follows a plan of action Creates emotional bounds Promotes change **reflection** self-evaluates (her actions directly) draws conclusions steps aside of situations describes and explains situations makes parallels identifies challenges

B. First codes from Camila's trajectory

Shared information about her profession	Monitored her actions
Simplified processes of productivity in emails	Organized resources for her action
Guided others for clarity	Coordinated actions with others
respected others' ideas	Manifested awareness of her colleagues working styles
Expressed her ideas with clarity	Took responsibility of her actions
Provided examples in her explanations	Pass responsibility to others
Showed commitment toward her institution	Ensured democratic participation in her action
Oriented others in the wiki with examples	Kept me informed and involved recurrently
Made information available to others (and me)	Set realistic time frames
Expressed her concerns -professional confidence	Alternated descriptions and explanations
Expressed intentions to build a collaborative community	Made links with socio-cultural situations
Made references to the socio-cultural context of teachers	Shared aspects of her professional expertise
Set limits in her actions (achievable)	Kept open to questions / Invited me to question her
Use resources for exemplifying and informing	Created links for further communication
Follow a path of actions	Expressed her interest on technology
Identified a problem based on her experience	Shared aspects of her working context
Showed awareness of her context (and teachers' guild)	Used technology pertinently and defined its use
Self-evaluated her actions	Linked theory and practice
Made decisions on what to evaluate	Made decisions to work with colleagues
Drew conclusions	Accommodated her actions to her colleagues
Made parallels with her classroom and social aspects	Motivated others into development
Replied emails pertinently (and formally)	Planned ahead
Commented/inquired on ethical aspects	Encourage others to collaborate
Shared her decisions with me	Inquired about aspects of academic practice
Challenge others in the wiki by questioning	Questioned her actions recurrently
Took responsibility to support others	Showed honesty toward her boundaries to work
Made personal decision	Review her past academic and pedagogical actions
Shared her goals with me	Identified the challenges in her school
Made questions in emails about the study	Provided evidence of her problem
Shared emotional accounts	Showed awareness of her actions
Expressed needs	Greet teachers with names

C. Codes from collaborative work in a wiki

Camila

Made questions to expand her understanding	Commented on all problems
Expressed belief about education based on experiences	Alternated descriptions and explanations
Analysed and evaluated situations affecting teachers in Chile	Made references to others in her comments and engaged others constantly in the discussions.
Answered all comments addressing her	Shared materials for supporting arguments, clarify information, inform about CPD opportunities
Created opportunities of dialogue with her fellow collaborators	Thanked contributions to her
Shared advise with the other teachers	Agreed with other ideas, and claims
Added professional believes about education, and the teaching profession,	disagreed with other ideas with arguments
discussed aspect of interest for her and paused topics in discussions	Invited others to reflect indirectly
Engaged in professional debate	Used academic jargon
Give advice to others in a direct way complemented with examples, reasons, and evidence.	Gave examples to clarify her points by liking them with classroom experiences
Gave examples based on her teaching	Made references to others outside the wiki as for exemplifying situations
Validated other ideas agreement/praising/ acknowledging	Shared pedagogical experiences and expressed emotions
Added anecdotes to illustrate her point of views	Gave Detailed descriptions of events
Shared experiential accounts from her teaching	Shared resources for teaching
Discussed her perspectives or interest	Gave varied examples to illustrate her points
commented on the teacher's profession and constrains of the profession	Shared Mineduc Material (contextual) for clarification and expanding perspectives
Exercised her technological skills for guidance and understanding of her ideas	Created arguments by questioning others alternating descriptions-explanations
Created links to exemplify ideas	Shared her knowledge about technology

Fernanda

Described situations	Gave methodological advice
Added information on her problem	Added description of school experiences,
Added independent and experiential ideas in the wiki	Added personal teaching experiences
Added independent solutions to the problems presented	Told what she has done as a reply to others
Showed ownership on her problems	Added direct advice to others
Expressed decisions in future actions	Directed methodological advice
Referred to her challenges at school level	Added ideas for supporting others
Reintroduced her problem in the wiki	Added solutions to the problems
Did not name others	Made references to her problem directly

Danitza

Made references to others outside the wiki	Created social relationships

Shared classroom anecdotes	Agreed with others, support others
Gave methodological tips	Referred to school reality (broader perspectives)
Reflected about education	Describes classroom experiences
Addressed the educational reality of schools	Agreeing with others
Made encouraging comments	Cheered others up
Gave advice for support	Motivated others
Replied promptly	Kept a friendly tone in writing
Provide ideas in a direct way	Describes and explained situations
Greeted in her contributions	Named others directly
Praised contribution (of Roberto & me)	Added empathetic comments
Greeted all teachers	Referenced ideas of others

APPENDIX 6: JORDAN AND HENDERSON'S (1995) SUGGESTED LENSES FOR THE ANALYSIS OF INTERACTIONS

Lenses	Foci for analysis
The structure of events- accounts-	This focuses on two aspects; (a) the beginning and endings of the accounts with an emphasis in the process of disengagement and; (b) segmentation that focuses on the accounts lasting and how the participants' move between accounts, and make evident they have reached a segment boundary
Artifacts and documents	This focuses on identifying the role of artifacts in the interaction process. For example, how they mark territory, ownerships, structure interaction, help to scaffold, and share experiences.
Turn-taking	This focuses on the whole arrange of behaviours that the participants use to take a turn. This includes the use of language and artifacts.
Participation Structures	This focuses on the participants' common task orientation and attentional focus which lead them to engage and get entry, and how technology supports/constrains particular participation structures.
Trouble and repair	This focuses on the different approaches and use of artefacts that the participants adopt to face trouble and repair it.
The spatial orientation of the activity	This focuses on the spaces/sites- of interaction -people occupy to interact with others, use object or resources, display their physical presence and voice –in this case in written discourse-. This also provides insights on how the ownership of territory affects the mobility of the participants.
The temporal organization of the online activity	This focuses -on a macro level- on the real time shape of the accounts, their high and low points, the relaxed and frenzied segments, and the temporal ordering of non-verbal activity. This also focuses on the periodicity and repetition of the accounts which may lead to boredom or development of routines.

Jordan and Henderson's suggested lenses for the analysis of interactions (adapted from Jordan & Henderson, 1995)

APPENDIX 7: List of thematic codes

Email, wiki and interview extract are presented with codes supporting organizational and locational regards including the participant, the mean of interaction, activity number and the thematic code emerging from the thematic analysis.

Participant code	Means of interaction code	Activity code	Thematic code
Camila-Cam	Email- email	About action research- act1	Expression of interest-interest
Carlo-Carlo	Social wiki- SW	Pictures for reflection -act2	Refers to Challenges-Chal
José-Jose	Problem solving wiki- PSW	Create a metaphor-act3	Reflects- reflect
Fernanda-Fer	(face-to-face) Interview- Int1, int2	Narrate a problem-act4	Expression of intentions-intent
Nelson- Nel	Online interview 1-OI1	Writing in a Wiki-act5	Manifests values-values
Claudio- Cla	Online interview 2- OI2	My profile-act6	Decision making- DM
Nadia- Nad		Hello group-act7	Requests orientation-Rorientation
Carolina -Car		Thinking questions-act8	Explains-expl
Patricio- Pat		Let's work together-act9	States criticism-critic
Danitza-Dan		Final strategies: summary-act10	Manifests a need-need
Roberto- Rob		Linking theory-practice-act11	seeks support- Seeksup
		Implementation support-act12	Thanks for assistance- thanks
		Final narration-act13	Receives support- Rsup
		Ping pong of ideas-act 14	Expresses emotion-emo
			Refers to practical problem-pp
			States a goal-goal
			Shares information and material- share
			Greets the group- Ggreet
			Refers to qualification- Qual
			Refers to hobbies and personal interests- Hob
			Informs about family- fam

APPENDIX 8: CONVENTIONS

The following conventions were used in the interview, wiki and email transcripts**:**

- ., punctuations are used to make the transcript readable.
- ? A question marks indicates a question has been asked
- CAPITALS if a speaker gives a syllable, word or phrase particular prominence.
- [*italics text*] for annotating non-verbal activity and adding relevant information Example; [*pointing at photo 1*] or [*Peter mentions 4 strategies*]
- (…) to indicate less relevant information taken out
- The researcher is Miguel, and the participants have fictional names

(adapted from Jefferson, 2004)

APPENDIX 9: MY REFLECTIVE LOG

Sample 1: reflections about getting access based on the piloting experience by adopting Gibb's (1998) reflective cycle framework.

What happened in this phase of the action research cycle? (Description)

I crafted the invitation[1] to the pilot by emphasizing the innovative technological, collaborative and reflective aspects this piloting may trigger in teachers performance and attitude toward the uses of technology. Thus, I wrote a simple and engaging invitation, which included the main objectives of the pilot, the participants' duties and my duties as a researcher. Clear dates, contacts email, and the possibility to clarity doubts were included as well. Then, I contacted 15 teachers through email and Facebook, by following a snowball procedure, and I ask them to share the invitation with their colleagues in their school. I was hopeful this was going to be the easiest part of the piloting. However, only six of my contacts answered within the next 3 days by replying "OK" or "I will try to do it", and after one week none of them replied to my invitation.

What were my reactions and feelings? (Feelings)

I felt extremely discouraged and disappointed at that time. In fact, I panicked, and I was upset with my colleagues for their lack of support toward me. I thought about changing the focus of my study, but then I realized it was only the beginning of a long journey and I remembered Guy Claxton (1999) advice on the "resilient" learner. Then, I decided to ask for support to my classmates and they advised me to contact the teacher directly and not through the "snowball process" (Dornyei, 2007:137).

What was good or bad about the action research experience? (Evaluation)

At that time, I did not feel the situation had been resolved as I realized that Chilean teachers had two main problems. Firstly, they work long hours and most of them are exhausted and will not have the time or the willingness to participate in the piloting. Secondly, some people do not check Facebook or emails regularly. I also realized that Facebook was not proving to be a reliable tool to contact participants. It was too informal for the purposes of my study. I also questioned the structure of the invitation was it too formal or informal? Sieber (in Sales 2000:18) mentions that the researcher should consider the "best means of getting access to population". Thus, distance aspects need to be understood as a barrier in this research, and my intentions must be focused on the prevention of these invisible walls.

What sense can you make of the situation? What was really going on? (Analysis)

After an analysis of the situation, I realized that the teachers were really busy with the end of term duties. This lack of time was complemented with some technological aspects that prevented the delivery of the letter. As I realized latter some teacher read the letter, but they took some time to think about it, and maybe adjust to their own time.

What can be concluded, in a general sense from these experiences and analyses I have undertaken? (Conclusions)

In retrospect, I would do lots of things in a different way. I shouldn't have taken for granted distance and teachers' busy schedules. I should have been more assertive in the design of the invitation letter, as I still believe it is too formal or unattractive for some teachers. Regarding my attitudes and feeling toward the teachers who did not reply to my emails I should be "respectful of the participants' decisions to participate or not" (Scott-Jones, in Sales 2000:27), I am an English teacher as well. And on the time of the interviews I was selfish as I only thought about my interests and needs. I should have "**really listen**" to my supervisors' comments regarding the complication of getting access. I remembered my words saying "oh no worries! Everything it is under control" when in fact it was just my enthusiastic and optimistic voice…

What am I going to do differently in the next stage? What steps am I going to take on the basis of what I have learnt? (Action Plans)

the letter I will include some aspect regarding "anonymity, confidentiality issues and avoidance of harm" (Somekh 2006:158) which can promote a sense of engagement in the participants.

Altrichter H., Feldman, A., Posch, P. and Somekh, B. (2008) *Teachers Investigate Their Work: an introduction to action research across the professions* (second edition) London and New York: Routledge

Creswell, J.W. (2007). *Qualitative inquiry* and *research design*: *Choosing among five approaches* (2nd ed.). Thousand Oaks, CA: Sage

Dörnyei, Z. (2007). *Research methods in applied linguistics: Quantitative, qualitative and mixed methodologies.* Oxford: Oxford University Press.

Mertens. D. (1998) *Research and Evaluation in Education and Psychology: Integrating Diversity with Quantitative, Qualitative, and Mixed Methods*. London: SAGE.

Sales, B. D., & Folkman, S. (Eds.). (2000). *Ethics in research with human participants*. Washington, DC, US: American Psychological Association.

Sample 2: reflections ignited by theory

Technologies in teacher education

"Web2 design is not itself enough to ensure a strongly felt collaborative experience of learning. We need to understand more about how technology works to our effective and cognitive advantage here. "(Crook 2008, 32)

As we know technological advances have increased in the last years and as such they have affected our views of the world and perceptions of things. Nowadays, we are living in a connected world where technological tools mediate some of our communications in personal, academic and professional settings. ICT in education has implied a different understanding of the ways we teach and learn, i.e "a change in the teaching approaches". These new changes have positive and negative sides. Better connectivity, interaction with others and access to more and varied resources of knowledge are framed in the positive connotations. However, I also see problems regarding to their use and applicability of those tools in educational setting. Are teachers prepared for the changing approaches enhanced by ICT? Are teachers using these webs 2.0 tools effectively? What can we do to support teachers in the use of technology? These are some of the questions I find interesting to answer …

Based on a Chilean context, I do believe that some teachers need support to adapt the new ICT teaching approaches. Some teachers see the uses of technology from a technical perspective rather than from a transformative learning tool. Thus, they don't go beyond the setting up and

basic transmission aspects of technologies. For example, they have replaced the uses of video/TV set for internet videos without generating bigger changes. To help teachers understand the uses of technology, we need to define two aspects (a) the **possibilities technologies can offer** and (b) our **goal or aim in the classroom**. I always remember one college from school who was really dependent of the uses of PPT in their classes. One day, we had a back out, and he lost control of his teaching. He professionally panicked and at the end of the day he commented *"I haven't done anything significant today...it's been a waste of time"*

"Technology should surrender to learning and teaching we cannot surrender to technology…" I am afraid this is happening in some classroom's context. (04.03.2017)

My philosophical research

"Language is a powerful tool for colonizing people's minds..." (Wane 2008:193*)*

If I had to mention one piece of reading that created a positive impact in my views and a change in my study interests, I would choose "Mapping the field of Indigenous knowledge in anti-colonial discourse: a transformative journey in education" by Njoki Wane. Not only because it is beautifully written but it also proposes a powerful research approach which was inspiring for me. It made me think about my evolving research aspirations and styles and made me realize about the nature of the different philosophical paradigms.

Every researcher has his/her own philosophical approaches to research which must include a clear rational regarding ontological, epistemological and methodological aspects. I have to recognize that I had a vague concept of the meanings of these concepts before I read Wane article. In her account of writing she outlined in a linear way her research approach by explaining how the nature of her world in Africa help her to create new knowledge and adapt a specific research methodology. She framed herself in a post-colonialism paradigm where her own contributions, reflections, discursive critique made sense as data for generating new ideas and knowledge.

After reflecting about these aspects, I have to confess that the notions of constructing knowledge in collaboration, social constructions, emancipation and objective/subjective method match some of my research interests. I also find interesting the relationship researcher-participants in terms of generating new knowledge and reflection… I can see clearly that my research approach has aspect of the social-constructivist and post-modernist approach at the moment. (04.11.2016)

Me as a researcher

"Being and becoming" a researcher implies bringing our biographies and experiences with us.. Giampapa (2011:133)

Today I had an open conversation with my supervisor about my new role as researcher and its implications for my development. Sally suggested leaving aside my hat of teacher to try a new hat of researcher. The realization that I am not a teacher anymore was kind of sad, but it makes a better sense for me now. It is clear that I am in a new stage of my life, I am in the process to "becoming" a researcher where reading, understanding ideas, linking reading to social aspects, writing, reflecting and more reading have become everyday ingredients of my professional and academic practices. All these made me think about the future changes my researcher life will bring to me…

First, as I am not a teacher any more I have to change my way of thinking about teaching. I read my previous writings and I realized that they were focussed on specific problems of teaching. I was not seeing teaching as a global and organic process, but as something restricted to community-based problems, such as lack of materials, students' lack of interest, etc…Teaching as a global and organic process has to do with the interaction of teaching with social and cultural aspects. That interaction can possibly improve societies. For example, countries like Finland have understood that education and teachers are essential roots to create a better society. Finland policy makers have put the teacher profession on a top position where to be a teacher demand intellectual knowledge, sacrifice and perseverance. They have understood that better prepared teacher can make a substantial contribution in every aspect of society. Teachers as researches are one of the ways to professionalize the profession. Teachers in action is the key, it implies a better preparation in research aspects. That's why for becoming a secondary teacher in Finland you need a master Qualification. You need knowledge of research, social processes and a deeper understanding of what you are doing.

As a researcher I plan to consider the notions of process and results. I tend to analyse the result of the teaching process in my writings. For example, a lesson planning, a good or bad teaching activity, a good or bad class, etc… However, little or no attention is given to the process to achieve that result. The same concept of process can be applied to teachers' formation. Teaching formation is an ongoing process that does not finish when you receive your certificate, it continuous and requires support from academics and other peers. I plan to help teachers in my

country by helping them understand the hidden process of what they are doing without forgetting I was a school teacher as well.

As a researcher I also want to find fundamental solutions to the problem of teaching not just to provide practical ideas and tips for success. I believe that every teaching problem has it reasons and interpretation. Some of them can be associated to broad, social and cultural aspects; while others can be treated more specifically.

Finally, Work for the teachers and not as a teacher. It is something that I have to understand now. After teaching for twelve years (without actually being challenged by anybody), I was quite convinced that I was very much on the right path (as a teacher). "Where to move from here?" was a question that often crossed my mind, and I believe I have made some wise decision to give the big step. I really love being a teacher and working with student. However, I have realized there are different approaches to working with them. It doesn't necessarily mean to be in the classroom all the time, I can participate in projects, do observations, etc... (03.11.2015)

Me, Myself and I

'*How can I go forward when I don't know which way I'm facing' John Lennon*

I have decided to put a lot of emphasis on myself in the following commentary because I was shaken by the realization that I don't actually know myself well. During our last module "qualitative studies" there were a number of occasions on which I was either unable to give an opinion because I didn't have a knowledge on the topic. I realized that becoming a researcher, is based on my learning and understanding, but at the same time it is apprenticeship of observation, an evolving change that sometimes overwhelm my thought. The taught course helped me to identify 'myself' as a researcher using tools and different techniques that I will use in the future, photos, interviews and video gave me new insights. In the meantime, I am this somewhat confused person grabbing at who I think I am... (A researcher? student?... teacher? ….) and what I think I should be but, I remain hopeful that through this journey I will define my identity and hopefully others will benefit from my efforts. When I refer to other, I mean teachers and students in Chile and why not in UK. (02.02.2014)

References:

Crook, C. (2008). Theories of formal and informal learning in the world of web 2.0. In S. Livingstone (Ed.) *Theorising the benefits of new technology for youth: Controversies of learning and development*. University of Oxford/ London School of Economics, Retrieved 15 October, 2009, from http://www.education.ox.ac.uk/esrcseries/uploaded/08_0314%20ESRC%20report_web.pdf

Giampapa, F. (2011). 'The politics of 'being and becoming' a researcher: Identity, power and negotiating the field'. *Journal of Language, Identity and Education*, vol 10., pp. 132 - 144

Wane, N. N. (2008). *Mapping the field of Indigenous knowledges in anti-colonial discourse: A transformative journey in education. Race Ethnicity and Education*, 11(2), 183-197.